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OUR MEDICINE MEN

BY

PAUL H. DE KRUIF



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TO
MY TEACHER OF BACTERIOLOGY
THIS BOOK IS DEDICATED
WITHOUT HIS PERMISSION

FOREWORD

A part of these essays has appeared in "The Century Magazine," and their publication has aroused the profound displeasure of many serious and possibly important persons. The pieces have been variously denounced as destructive, ignorant, rotten, wrong-headed, and detrimental to progress. This writer deplores these criticisms, for, while it is true that he had no intention to moralize or to improve the world, he did attempt to recount in a fair and restrained manner the reactions which twelve years of contact with medicine men have called forth in him.

He has made an earnest effort to be restrained, but, try as he would, it was impossible to avoid introducing a faintly ribald flavor into his writings. He hastens to assure his readers that this has crept in not because medicine is in essence wholly ribald or ridiculous. On the other hand, he believes that of the five great professions it stands next to that of engineering in its contributions to progress. The ribaldry has appeared by reason of a slight, but incurable, clownishness and impishness of his own mind. For, unfortu-

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nately or not, all important and solemn things excepting science and the high arts have to his view overtones of the preposterous and bizarre.

The publishers have asked that he give the *raison d'être* of this book. It is as follows. While fishing and loafing in the fastnesses of Newfoundland he was overwhelmed by the vision of a great contrast, and, thus overcome, was forced to give voice to it. He has tried to paint the picture of the contrast between the fine old practitioners of the Osler type and the somewhat ridiculous new pseudo-scientific ones; between the white cold light of quantitative science and the inky murk of a practice that is no longer an art and has not yet begun to be a science. In brief, he has tried to portray certain strong differences between things that are pretentious and those that are modest, between things that are false and those that are true.

DE KRUIF

September 1, 1922

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CHAPTER I

THE DIGNITY OF THE MEDICAL PROFESSION

THE dignity of medical men is as old as the history of mankind. It was laughed at by the ancient Aristophanes, who made disparaging comparisons between the worth of their services to the commonwealth, and their foppish appearance and affected demeanor. It makes its appearance in the paintings of Dutch artists of the sixteenth century, who represented doctors as richly dressed individuals of distinguished bearing. The English physician of two hundred years ago was famous for his immaculate dress, his courtly manners, his gold-headed cane. The successful medico of the present time, while not usually to be placed in the category of the dude, still is marked at once by an aura of professional

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seriousness and gravity of bearing that is unmistakable even to casual observers.

It is natural and right that doctors should affect this appearance, and that they should be held in high regard. For the function of the healer of our ills is certainly of greater importance than that of mob-masters or birch-men, and at least as valuable and necessary as that of the priest. The physician, like his clerical brother, is of great value in feeding the hopes and soothing the fears of men. Until recent years, the functions of these two have differed in slight degree only, and they have been held in awe for much the same reasons.

Like that of the priest, the position of the doctor in the respect and awe of his fellow human beings has always been impregnable. It has not been shaken by the raillery of Aristophanes. The epigrammatic invective of the great Da Vinci has failed to disturb it. Butler's sarcasms on doctors in "Hudibras" are smiled at and forgotten. The tolerance of Molière's "L'Amour Médecin" by French physicians is well known, and modern healers, knowing the invulnerability

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of their trenches, think of "The Doctor's Dilemma" as a clever but superficial drama. None of these masterpieces, which combine close observation with matchless wit, have had any effect upon the authority or power of the medical profession. Thus it is evidently futile for writers of far less skill to make an attempt in which great satirists have so signally failed.

They were one and all convinced that the people of their times could exist as well, perhaps better, without the ministrations of men who appeared to them as bogus Magi. The fearlessness and power of their attack deserves immortality, but their railleries were considered as buffooneries by the laity and dismissed with amiable shrugs by the objects of their diatribes. It is far from the purpose of the writer to attempt a propaganda for the abolition of the medical profession. The desire is only to inquire into the causes for its present extraordinary magnificence and prosperity, and to discover, if possible, whether these are due to a commensurate increase in the value of its services.

The state of flux existing in the majority of

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human institutions at present is a commonplace of observation. This condition has affected even the medical profession, which, until fifty or sixty years ago, had undergone no important fundamental change for a thousand years. It is noticeable that the doctor is rapidly losing his important rôle of comforter and friend. He is no longer considered to be privy to the secrets of black magic, or to derive his healing powers from intimate acquaintance with gnomes, sprites, devils, or deities. He is venerated instead, because of the growing belief that he is one of the chosen disciples of the new God of Science. In the middle ages the brothers of the Rosy Cross befuddled their clients by their supposed possession of the philosopher's stone. At present the healer awes his patients by coming to them reeking of the laboratory, or by allowing them to see, as if by accident, his scientific proceedings with colorimeters, syringes, and guinea-pigs. There are a growing number of individuals who begin to affect disdain for the ministrations and pretensions of holy clerks. The success of physicians in avoiding this contempt is due mainly to the

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Machiavellian celerity with which they have forsaken the old gods at the moment of their decline. Finding that the superstition that upheld these latter for so long is beginning to be scoffed at, the medico cleverly takes advantage of the new credo in the omnipotence of science.

The medical profession is proud of its supposed connection with science. It forgets the old gods easily and is not afraid to poke fun at them. Its members do not fear to expose and to laugh at the charlatanry, superstition, and ignorance of even the best of old-time physicians. They become mirthful over the solemn imbecilities of the votaries of the legendary Egyptian I-em-hetep. They point with derision to the therapy of those doctors of 4000 b.c. who advised that baldness be treated with a pomade made up of equal parts of the fat of the lion, hippopotamus, crocodile, goose, serpent, and ibex. They rail good-naturedly at the ancient rites of incubation practised by the priests of the Æsculapian cult, and at the ministrations of Hygieia and Panacea, who combined the function of physician with that of hostler to the sacred

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snakes. They form clubs to make merry over the largely idiotic folk-lore of the Hindu Charakha. It is common for them to refer facetiously to the windy theories of Galen and to deprecate the bonds in which these dicta held medicine for more than a thousand years. They allude with merriment to the mysterious drugs and abominable concoctions of Paracelsus, and agree with Molière in his sarcasms on the sterile pedantry of the French physicians of the time of Louis XIV.

In a word, they would have us believe that the bigotry and superstition of the medicine man have passed away, to be replaced by the glorious spirit of investigation and open-mindedness of Da Vinci and Galileo, of Newton and Faraday. Now, it is true that science has modified the practice of medicine. But it is absurd to pretend that the present personnel of the profession is essentially superior in intellect, or more free from superstition, than the followers of the Hindu "Vaghbota," or the disciples of the Greek Galen.

It is certain that this pretense of physicians threatens to turn medicine from its primordial and proper function of healing and soothing our

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ills, toward a quackish assumption of the dignity of science. It is possible to study disease scientifically, but it is absurd to presume that this can be done by the rank and file of doctors. Yet the confusion of the art of healing and the science of the study of disease is wide-spread and disastrous. Its analysis and criticism will form the principal subject of the dissertations that follow.

The physician *should* be venerated, not for supernatural knowledge or for scientific acumen, but for his understanding of man's ills and troubles, for raising his patient's morale, and for applying, as a technologist, the therapeutic and prophylactic discoveries furnished him by the small group of scientists who actually study disease.

The first indications of the decline of the priestly function of doctors are to be found in the awakening of the spirit of independent inquiry and rebellion against authority that marked the Renaissance. For more than a thousand years physicians had accepted almost without reservation the tissue of dogma and solemn nonsense promulgated by the arch-quack, Galen.

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Vesalius was the first of the iconoclasts. The ideas of Galen on the structure of the human body were to a large extent purely speculative. Vesalius threw aside this sacred balderdash, and, using purely objective methods, overturned the prevailing notions of anatomy, making of it a living science of observation. It might be expected that his colleagues would have acclaimed him and accepted his demonstrations in the spirit of scientific men. But this was by no means the case. On the contrary, they ignored him or opposed him bitterly, and joined with those arch-enemies of science, the clergy, in placing every obstacle in his way.

Finally, in disgust, he gave up his splendid work and became respectable. He married and settled down as court physician to Charles V of Spain, and so passed his best years in a degrading position, akin to that of the modern society doctor. But at last he became disgusted with his rôle of prostitute, and, inspired by the researches of his former pupil, Fallopius, brilliantly revived his scientific activity. At once he paid the penalty. He was scorned by king and

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courtiers, by priests and colleagues, and died an obscure and poverty-stricken wanderer.

At the time of Vesalius, and for centuries after, the church and the medical profession vied with each other in denouncing and inhibiting the spirit of fearless inquiry necessary to medical progress. The doctors effected this by disdain and ostracism of the colleague who was fired by the itch to know. The church opposed him by downright persecution, by torture and death. This clerical opposition, contrary to belief, was not confined to the Romish church. For example, the most abominable instance of persecution of science in all history is that of the burning of the anatomist, Servetus, by Calvin, the father of Presbyterians.

For centuries after Vesalius, the progress of the science of the study of the body and its malaises was discontinuous and fragmentary. It was opposed constantly by physicians of all ranks. It was advanced as much by monks, chemists, and even merchants as by orthodox doctors. The few fundamental discoveries that occurred at long intervals had no marked influ-

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ence on the still priestly spirit of the profession. In the seventeenth century, Harvey demonstrated the circulation of the blood and so founded experimental physiology. But his investigation did not arouse great applause among physicians or cause experimental physiologists to spring from their ranks. A little while after, Leeuwenhoek, a Dutch merchant, who spent his leisure moments in grinding lenses, discovered the world of microscopic beings, the existence of which until then had been hardly suspected. His observations foreshadowed the revolutionary researches of Pasteur, but during his time they were largely ignored by the medicine men.

The eighteenth century, again, was one of a few splendid achievements, set off in sharp relief against a dark background of stupidity and stagnation. The advances were made largely by men not of the cloth. The monk, Spallanzani, demonstrated the regeneration of tissues, made suggestive experiments in respiration, and refuted the doctrine of spontaneous generation of life. The Scotch chemist, Black, and the Frenchman, Lavoisier, elucidated the mysteries of respiration,

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and the Englishman, Jenner, introduced vaccination against smallpox. These are the beacon lights on the dark sea of sterile theory and empty formalism. They were vigorously and conscientiously opposed, or entirely ignored, by the medical rank and file.

It remained for the nineteenth century to witness the general penetration of the chaotic and foolish body of medical folk-lore by experimental science. Physicians began to feel the buffets that knowledge inflicted upon their quackery and their idiotic theories. Chemistry and physics and their technological application were bringing about the industrial revolution. It was natural that the increase in importance of these sciences should hasten their application to biology and to medicine. Physics and chemistry had broken away from the absurdities of alchemy. They were obviously of great utility to mankind. They were respected, while the priestly pedantry of medicine began to be the subject of scorn.

Magendie was one of the first of the nineteenth century physicians to realize thoroughly the prime necessity of these sciences in the study

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of the body and its derangements. He was an indefatigable experimenter, fearing to make even tentative hypotheses and insisting always upon the utter emptiness of vitalistic concepts. He felt that the science of the study of disease was too young for theories. He believed that the attention of experimenters should be devoted to the discovery of facts. After Magendie, the work of Schwann and of Caignard de la Tour indicated the rôle of minute living organisms in the processes of fermentation, and suggested to Pasteur that many diseases were similarly caused by beings beneath the range of ordinary vision.

Pasteur's struggles to convince medical men that his researches revolutionized their conception of disease are most instructive and illuminating. His ideas met with violent opposition or complete indifference by all but a very few physicians. These gentlemen opposed him, mind you, not on the ground of the fallacy of his notions, but because he was a mere chemist, and not a doctor, and as a result could know nothing of disease. But he battled on with a splendid stubborn determination, combating the appalling

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ignorance of the medical profession with unbelievable patience and persistence. His encouragement came from a few friends, chemists, physicists, and physiologists.

The turning point in the attitude of doctors toward his work is to be found in the application of his researches to surgery by the Englishman, Lister, and in his own dramatic demonstration of the possibility of vaccinating cattle against anthrax. His medical and veterinary opponents induced him to stage a public experiment, hoping that its failure, which they ignorantly believed to be certain, would finally discredit him and leave them to the peaceful practice of their own imbecilities and charlatanry. This plan proved a veritable boomerang to Pasteur's persecutors. the experiment was simple, but crushingly convincing. Pasteur took a large number of sheep and divided them into two groups. The first he inoculated with his anthrax vaccine, the second were left without treatment. A certain number of days after the vaccination of the first group, *all* of the sheep were injected with a virulent culture of anthrax microbes. All of the control

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sheep, i. e., those which had not been previously inoculated, died in a few days. But, to the dismay of his tormenters, all of the vaccinated ones survived without symptoms of the malady. This beautiful experiment created confusion in the ranks of the medical cult. What is more, Lister, who was one of the few accredited physicians in existence to show open-mindedness or even the rudiments of sense, was revolutionizing the craft of surgery by applying Pasteur's ideas.

These events finally brought doctors to the realization that the days of their priesthood were over. The study of disease had been elevated to the dignity of a science, ironically enough, by a mere chemist. But physicians did not blush at this. They hurried to lay aside completely their pretensions to mystic powers, and began to claim for themselves the honor due to investigators alone.

It was well for them that they shed the ancient habiliments of the medicine man. The raiment of the priest was in the process of being reduced to tatters by the assaults of the followers of Darwin, led by Huxley. Christianity and mysti-

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cism were being shaken to their foundations by science and evolutionism. The assumption of the dignity of scientists enormously enhanced the prestige of physicians everywhere, but it is in America that this assumption has been most bold and blatant. The American, generally deficient in thorough education and sound culture, is more naïve than his European brother. So it is the American doctor who presents the best demonstration of this attempt of physicians to replace their priestly dignity by questionable claims to residence on the austere heights of science. And it is this amusing spectacle that the following chapters will endeavor to reveal, in a restrained and dignified manner.

CHAPTER II

THE RÔLE OF CREDULITY

THE supposedly dense and wide-spread ignorance of the human race in former centuries is usually brought forward to explain the quackeries of physicians of olden times. Literacy was in those days the possession of a chosen few. Power of independent ratiocination was confined to but a small proportion of the literate individuals. It would be natural, then, to suppose that this lack of education might account for beliefs that to us seem incredibly silly. The moderns look with amused tolerance upon people who accepted the legends of the immaculate conception and of the raising of the dead by Christ or his disciples. They understand the cause of the perpetuation of the yarn concerning lepers who were cured by a simple laying on of hands. It is not surprising that stews of insects or

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rodents, and decoctions of the excreta of animals, were firmly believed to be of great efficacy in the therapy of many serious diseases. Wandering medicine men at village fairs, itinerant mountebanks, charlatans of all sorts, might fool the uneducated yokels with such remedies.

But the theory that this universal success of quackery was due to a lack of education receives a rude buffet when we find that physicians and philosophers of the first rank used the abominable brews of the type just mentioned, with an enthusiasm equal to that of the most obvious fakers. For example, the early editions of the "*English Pharmacopœia*," the official handbook of recognized physicians, recommended such revolting mixtures for the treatment of many ills. And the supposedly highly educated clients of the most distinguished physicians were ready to swallow such potions with enthusiasm, in the firm belief that they were of great efficacy.

Such considerations force the conclusion that it is wrong for historians of medicine to differentiate between reputable physicians and quacks. The difference between the two was a quantita-

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tive one of minute degree. In reality, on the evidence of the facts at hand, it would be right to consider them one and all as fakers of the first class. It may be objected that the reputable physicians of olden times are not to be placed in such low company, since they seriously believed in the efficacy of their nostrums. But it is really to be doubted whether their sincerity was any greater than that of the lowest runagate, since all people come to believe firmly in the virtues of any cause for which they stand, no matter how silly or how bizarre it may be. It is only necessary that they repeat their slogans often enough, or administer their remedies a sufficient number of times. At any rate, if the fakers knew that they were fooling the people, and if, at the same time, physicians were convinced of their own honesty, the fakers, as knaves, must be ranked as superior in intelligence to the physicians, as fools.

It must be admitted that there is a faintly perceptible and increasing amelioration of the almost universal gullibility of other days. On the other hand, the most casual sort of observation

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will show that credulity is rampant everywhere. It may, indeed, be justly considered the most wide-spread and evil of any of the numerous faults and errors of humanity. It is credulity that is the major cause of the childlike awe and ready acceptance of the medical mythology of to-day, as well as of other times. This fundamental intellectual defect is common to all of us. It has been apparent even in a supreme intellect like Descartes, who devoted a great part of his time to haranguing against it. Descartes maintained that the attitude of systematic doubt of all beliefs and concepts was the first essential of sound philosophy, yet we find him making statements in his physiological work "De Homine" which to-day are known to be absurd and based on unquestioning credulity.

The gullibility of the great body of the plain people of to-day, to say nothing of the lower strata, is too well known to justify lengthy consideration. Thousands of solid citizens of our communities, merchants, aldermen, Rotarians, Kiwanisians, are firmly convinced that the temporary lifting of the ban on *spiritus frumenti*

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checked the recent terrible epidemic of influenza and saved many lives. These same pillars of society allow their wives to "dope" themselves with the vegetable compound of Mrs. Pinkham, and believe with their daughters that the systematic imbibition of Nujol leads to the seductive and irresistible pink complexion displayed on the advertisements in subway trains. These men frequently know themselves to have derived great benefit from the maulings of chiropractors and the foolish rumble-bumble of Freudian psychoanalysts. They flock in thousands to the prosperous temples of the faith of the late lamented scientific old lady of Boston. They indorse the encomiums of David Belasco, Sir Gilbert Parker, and others of the middle-class intelligentsia, in regard to the new elixir of life called Sanatogen.

It is time to turn from the consideration of the gullibility of the supposedly intelligent middle class to that of the members of an intellectual aristocracy, i. e., the college professors. Dr. Frederick Peterson in an admirable essay entitled "Credulity and Cures" disposes neatly of the pretensions of our tutors to the doubting,

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critical spirit. He mentions, for example, the case of Professor John Dewey, who is conceded to be of the *crème de la crème* of the American best minds. This philosopher indorses enthusiastically the panaceas offered in a pompous tome called "Man's Supreme Inheritance." The book is a collection of childish piffle which claims to point out the easy road to perfect health. It is important to observe that the simple perusal of the book does not effect this. It is necessary, in addition, to consult its author, the famous Alexander.

Another instance of appalling credulity and childlike faith is that of a professor of chemistry in a great university of our Middle West. The savant in question had been listening to a dissertation by a colleague in the department of philosophy. The philosopher's remarks had led to the conclusion that there was, at the present time, no proof whatever of life after death. The lecture over, the good chemist sought out the philosopher at once and asked, "But do you really believe that there is no proof of a future life?" Receiving an affirmative reply, he turned away

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with the remark that the philosopher could not have read the book by Sir Oliver Lodge entitled "Raymond."

This incident, you will all agree, is a sad and illuminating one. The chemist in question is not the kind of hopeless fossil who helps to snuff out the spark of intellect in the eager young peasants of one-building universities and minor denominational colleges. On the contrary, he is an important teacher in a large institution which is proud to number its attendance in five figures. He published important researches in his youth. In his middle years, having become, perhaps, a little too respectable for the faint aura of irregularity that attends active and fervent investigation, he wrote a text-book of physical chemistry which presented that science in broad philosophical terms. Finally, his activities as author completed, he has reached his apogee as head of a department, as expert administrator, as chairman of committees, and as assistant to faculty ladies in the function of arbiter of the social pretensions of the struggling smaller fry of the university corps of instructors. Yet he believes

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whole-heartedly in a volume which must be dismissed by the judicious as a supreme example of unmitigated tosh.

The above instances demonstrate sufficiently the peculiar derangements to which the greatest American minds are prone. The laity disposed of, it is necessary to examine into the gullibility of the gentlemen who condescend to bestow this name upon the populace at large. Credulity, which makes it easy for doctors to propagate their myths, is common as well to the medical profession itself. This follows naturally from the fact that the populace at large forms the raw material from which physicians are made. It is well known that entrance to a medical college is not based upon a requirement of independence of intellect, but only upon credits earned in a certain number of years of pre-medical education. Since these can be won by any one slightly above the mental capacity of an imbecile, it is clear that the medical student must be fairly representative of the average citizen, and consequently prone to the same aberrations of the intelligence. Accordingly, if physicians

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as a class are independent thinkers, in contrast to the laity, it would have to be assumed that the process of medical education had inculcated this characteristic of individualized thought. This assumption, as a later chapter will reveal, is ridiculous and absurd.

The herd thought of the medico is accurately exposed by the above-mentioned Peterson. This author displays a candor altogether astounding in one of his profession. It is still more amazing that his devastating statements are published in the chief gazette of the American followers of Æsculapius. This can be accounted for only on the assumption that the editor knows the journal to be read almost exclusively by the medical brotherhood, and that the freemasonry of the guild will prevent the propagation of such scandalous heresies.

The fifty years that have passed since Pasteur's fundamental studies have witnessed the perpetration of a confusion and glittering array of hoaxes on the medical profession. These have followed each other with kaleidoscopic rapidity, rising meteorically and disappearing like ex-

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ploded rockets. While some of the fads have arisen from a basis of sound science, the majority have had as little validity as the remarkable plaster described by Mark Twain. This poultice, the purpose of which was to reduce inflammations, was of such potency that, when placed on the patient's head, it drew his lungs out through his mouth!

The fact that doctors are at present less tenacious in their use of spurious remedies might be presented as a proof of their superior enlightenment. Accordingly, while the merits of the famous plaster described by Twain were undoubtedly believed in for thousands of years, certain modern balsams enjoy a heyday of only a few years' duration. In reality, the readiness of medicos to forsake old panaceas for new is a sign of the current instability, caprice, and love of change that plagues mankind. This is the most important characteristic differentiating the present civilization from older cultures, which, if equally dubious, were certainly more inflexible and stubborn.

Interesting and amusing volumes might be

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written in description of the cures, theories, and isms that have raged in the medical profession during the last fifty years. It is sad to relate that some of these, which have had a firm scientific basis, have fallen into disrepute entirely because of their idiotic misapplication. Others, arising from more or less sound experiments, have been perverted through complete misapprehension of their values and limitations, and through unwarranted commercial exploitation. Take, for example, the case of bacterial vaccines. Their use in the treatment of certain ailments was first popularized in the medical profession by the Englishman, Almroth Wright. He taught that for a vaccine to be valuable, it was preferable to prepare it from a microbe isolated from the patient himself. This advice is based upon the fact that a given species of microbe contains a variety of races, one of which may be the cause of infection in certain individuals, another the noxious invader in other persons. It is known that the immunity conferred by the injection of a vaccine prepared from one race might fail entirely to be effective against an-

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other. Wright, therefore, argued that by obtaining the microbe actually infecting a given patient, he would be certain to employ a germ specific for that infection. Such a vaccine is called "autogenous."

Now, the preparation of this autogenous vaccine involves time and considerable technical skill. These two requisites are possessed, it is well known, by very few of the rank and file of physicians. The majority of them are notoriously busy and distracted. They find it necessary to rush about from one case to the next, and in general lead a life which is the antithesis of that of a careful technologist or investigator. The technical skill of most of them, in bacteriology, is negligible.

Despite this, the reports of Wright, which glowed with optimism, popularized the use of vaccines. "Vaccine therapy" became a slogan, first among the more adventurous and advanced, then among the generality of doctors. But the original instructions of Wright were largely lost sight of. It became the idea that, so long as one injected a vaccine, the cure followed as a matter

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of course. Frequently the real microbial cause of the malady under treatment is not even accurately determined. Rather, it is sloppily sought for by a cook-book bacteriological technic. If the result of this procedure is ambiguous, the causative agent is shrewdly guessed at, and a corresponding commercial "stock" vaccine is injected.

The demand for vaccines rose as the slogan spread. Few physicians stopped to inquire how vaccine worked: it sufficed only to hear and to believe that they cured many diseases. Organizations which may be described as "vaccine factories" arose in the land to supply the growing clamor. These, like all up-to-date commercial institutions, undertook not only to supply the needs existing, but created additional demands by assiduous advertisement. This entry of the vaccine into commerce furnished the *coup de grâce* to any remaining chance of its sound application to the few ailments in which it seems to be efficacious. The vaccine factories vied with each other in *thinking up* new diseases for which their products might be valuable. Their adver-

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tising claims became increasingly absurd and extravagant in the manner of the spirit of advertisement that animates the majority of the successful merchants of our nation. They stop at nothing. Their impudent perversion of scientific truth knows no bounds. Vaccines are placed on the market for diseases the microbial cause of which is unknown. It would not be astounding to read that a vaccine has been perfected against broken legs, diabetes insipidus, or concussion of the brain.

The success of some of these commercialists in debauching medicos resulted in an incredible augmentation of their own prosperity. Consider, for instance, the romantic history of an obscure physician in a large Middle Western city. This doctor, with a mediocre training in bacteriology, began the manufacture of vaccine on a small scale, assisted only by his children and a pre-Bolshevik Russian socialist of dubious antecedents and honesty. Clever advertising, combined with the incredible credulity of the physicians of the city, gave rise to an enormous prosperity. He now holds forth in a magnificent building,

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ironically called a laboratory. He rolls about ostentatiously in an expensive automobile. He becomes a figure of prominence in his community. It is of interest to note that some dignified and reputable medical journals advertise his dubious wares, although, at the same time, editorially protesting against quackery of this type.

To sum up, the human instinct of credulity makes it easy for physicians to hoax the laity and for a few doctors to fool the medical profession as a whole. It is not necessary to dilate further upon this well-known human aberration. It is only necessary to turn to the remarkable essay of Schopenhauer on "The Art of Controversy" for a lucid exposition of its mechanism and its nefarious effects. The writer refers to this author with some trepidation. He is indubitably a Teuton, and it is impossible for his admirers to prove that he was not of German, but actually of Polish, Flemish, or Czechish origin. In consequence, let it be remembered that he is recommended only to those Americans who do not patriotically hate all Germans from the time of Johann Sebastian Bach onward.

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But to return to the reason for the recommendation of Schopenhauer's essay. This philosopher points out that the great majority of people not only hate and fear, but are actually incapable of independent thought. They prefer, rather, to be intellectual sheep, and to follow the dicta of individuals whose theories and utterances are most pleasing to them. From this, it is easy to see that the generality of a belief in anything is no indication at all of its soundness and validity. One or two persons, who may have been right or wrong, as the case may be, originally stated the concept, or the supposed fact. It is then handed on from one person to another, generalizing in direct proportion to its ease of comprehension and its soothing effect.

This appeal to authority, which in the art of controversy is called *argumentum ad verecundiam* is widely used in medicine, frequently with disastrous effect. To attach the name of Wright or Metschnikoff or Mayo or Ehrlich to a remedy or method of treatment is to assure its indiscriminate and wide-spread use. It is true that the men bearing these names have been impor-

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tant in the advancement of the study of disease or of medical technology. But they were sometimes wrong, and at other times their cautious and sound recommendations have been sadly distorted by the uncritical enthusiasm and gullibility of their horde of followers.

CHAPTER III

ON A MISCONCEPTION OF THE RÔLE OF PHYSICIANS

IT will be recalled that in a previous chapter the present dignity of doctors was attributed to their pretension to science. This pretense is very widely accepted, although it rests upon an obvious fallacy. The object of the present dissertation will be the exposition of this error, and the attempt to delineate the real function of the physician.

At the present moment, much more is heard of the term "medical science" than of the "practice of medicine." And it is a short step from the phrase "medical science" to that of "the science of medicine." Now, it is clear that the latter designation places medicine on a footing of equality to the well-established sciences of physics and chemistry. This constantly awakens the amusement or the ire of physicists and chemists.

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It is true that the emptiness of such a pretense would be laughable did it not lead to such great intellectual confusion. But since clarity and honesty of intellectual concepts are among the few things of which mankind may be proud, it is necessary to remove fallacious ideas of this nature, and it is a wrong and essentially decadent tendency to stand aside with a smile of superiority, or to shrug one's shoulders with resigned cynicism.

The confusion of thought which has given rise to the term "science of medicine" is not confined to upstarts, charlatans, and men of silly and vapid intellect. On the contrary, physicians of great dignity and distinction use it constantly. Some years ago, for example, the presidency of the American Medical Association was held by a man of this caliber. His inaugural address was concerned with the contributions of medicine to civilization, and in this oration the new president stressed in an entirely laudable manner the importance of science to medicine. But then, carried away by his enthusiasm, he made claims that are open to serious question. For instance, he

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asserted that “the history of medicine is the history of mankind.” This remark implies that when civilizations have been complex and highly developed, medicine was correspondingly important and of great service. Now, it must be admitted that even a casual knowledge of history, lay and medical, will convince any one of the fundamental absurdity of such a statement. The civilizations of the Egyptians, Babylonians, Greeks, and Aztecs were refined, and in many respects greatly superior to our own. Yet the medical practice and theory current in any of these was largely a mass of superstitious twaddle, propagated by priests who are not to be considered of scientific or even ordinary intellectual persuasion. The contributions of such priesthoods to the success and health of these civilizations were undoubtedly so minute as to be virtually negligible.

What is more, the great man stated that “medicine has done more for the growth of science than any other profession, and its best representatives have been among the leaders in the advancement of knowledge.” This remark must be regret-

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fully dismissed as empty and without foundation. The genuine sciences of mathematics, astronomy, physics, and chemistry, owe almost nothing to medicine, and remarkably little to physicians. An earnest attempt to call to mind medical men who have been protagonists in these fields reveals only the names of Young, Mayer, Helmholtz, and Loeb. This is a feeble showing, when one considers the high proportion of physicians among the supposedly intelligent men of all times.

Now, the dearth of doctors among the superior investigators in these fields would seem at first glance to be remarkable. On the contrary, it is really perfectly natural and very easy to explain. To tell the truth, the medical man, if he remains in the practice of his profession, must, by temperament and because of the demands of his work, lack the very qualities that are necessary to the investigator. This will be more apparent in the subsequent analyses.

Another leader of medicos boldly asserts "that medicine must even now be considered *not as*

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applied, but as an independent science." In fact, his remarks in general would lead one to believe that physicists and chemists are to be degraded to the ranks of handmaidens or body-servants, to obey the commands of that super-scientist, the modern doctor. In order to point out the fundamental error inherent in claims of this kind, it is necessary to indicate the meaning of the word "science," as it is at present understood by investigators. In reality, science is concerned with the investigation of the quantitative relationships of factors governing natural phenomena. Descriptive science is a misnomer. It must inevitably be a prey to the inaccuracies imposed by the limitations of the perceptions and by the personal equation. It is to be compared to the reports of the explorer traveling in a far country. These reports are frequently interesting, but are colored to a large extent by the urbane hospitality or the hostile attitude of the inhabitants. In quantitative science, on the other hand, some measure of agreement between different investigators can be arrived at. And it

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becomes more and more possible to express quantitative data in equations, from which verifiable predictions can be made.

It is well known that the scientific worker must be cool, disinterested, and impartial in making his experiments and in recording their results. It is well for him to show imagination and fire in formulating his hypotheses and at the birth of his ideas. It is inspiring to think of that *angoise*, so beautifully described by Verhaeren, with which the scientist attends the confirmation or collapse of his theories. But during the experiment he must weigh accurately and measure exactly; he must be completely impartial in recording the preponderance of one or the other of the factors revealed by his results. He must not hurrah for one, or hate the other. They must be to him as so many undifferentiated paving blocks are to the pedestrian, or so many undifferentiated doughboys to our great General Wood.

Now, it is well known that the supposed function of the medical practitioner is to cure disease. His relationship to his patient should be,

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therefore, that of a comrade coming to the aid of a stricken friend. He must desire the successful recovery of his client. He must hate the microbe that harasses the sufferer so malignantly. This state of enthusiasm for the patient and enmity toward his disease is clearly a highly emotional one. It has been demonstrated that such emotions are out of place in science, no matter how valuable they may be in other walks of life. Hence it is futile to bring the business of the physician into the scientific domain.

When the practitioner of medicine ceases to be the optimistic and sympathetic friend of his patient and becomes the cold man of science, he loses a large part of his value. People in general know this and consequently shun a doctor of this type, no matter how able he may be. They go, instead, to a physician of minor attainments, but of a buoyancy and human quality that is very valuable in maintaining the morale of both the sufferer and his family.

Distinguished physicians, who wish to pass beyond the necessary limitations of the art, still realize the necessity of the qualities of humanity

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in doctors. This will be clear from the remarks of the gentleman who was just quoted as demanding that medicine be called an independent science. He adds that, while disease must be *studied* in the modern university hospital, at the same time *nothing should be left undone to cure the patient*. This statement contains a contradiction that reduces it to absurdity. For, in order to study the various phases of a disease with the requisite thoroughness, it is frequently necessary to abstain from any interference with its course. This is also true of investigations of therapeutic measures.

Accordingly, when our friend demands that nothing be left undone to cure the patients, he asks, in effect, that the first principle of a valid experiment be abrogated. Some of the patients will of necessity have to remain without treatment, if it is desired to conduct a sound investigation. This will be evident from the following example: The first principle of a sound experiment, concerned, let us say, with a test of the efficacy of X-rays in the treatment of cancer, would be the selection of a large number of patients

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having the disease in a certain stage. All of these individuals would then be placed under identical conditions in regard to diet, nursing, and general care. Then, a *part* of the sufferers would be subjected to accurately measured doses of the Roentgen rays, while an equal number would receive no treatment at all save the general care just mentioned. Now, if the X-rayed group showed a large proportion of cures or ameliorations, while the majority of the other subjects became worse or died, it might be reasonably concluded that the rays showed some curative effect. The untreated cases, called controls, would then have sacrificed themselves to the progress of science. But if this were done it would constitute a neglect of the demand of our good doctor that nothing be left undone to cure the patient.

Granted that such an experiment could be made on a large number of cases covering a long period of time, it is doubtful whether it would be feasible to make the attempt. In the present stage of civilization, it would certainly not be advisable. Imagine, if you will, the clamor and uproar that would ensue among the family and

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friends of the "controls," that is to say, the untreated patients. Lack of space prevents the depiction of such a scene. In reality, the family and friends would by present standards be right in their protests. Humanity as a whole is certainly not ready for a generalized martyrdom to the progress of knowledge. It is not ready to take the place of the laboratory guinea-pig. It is a long way from the state of the disemboweled itch to know that was the possession of the ancients in the fifth part of Shaw's "Back to Methuselah."

Fortunately for us, the greater part of practitioners have not reached the judicial, unemotional state necessary to the proper conduct of such an experiment. When a remedy is placed at their disposal, they usually administer it to as many people as desire their services, and, in their enthusiasm for the supposed efficacy of the cure, remark, "To hell with controls." They rely for knowledge as to its efficacy upon their "impressions," or upon the statistical method. This method, in brief, counts the degree of mortality in the cases treated with a given nostrum,

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as compared to the mortality in a previous series of cases not treated at all, or treated differently. This method is full of errors, as any one can plainly see.

On the other hand, their enthusiasm and unction in administering the drug may greatly raise the morale of the patient, better enabling him to battle with his malady. So, happily, it may matter little whether the treatment, *per se*, has an effect on the disease. It is enough that the patient take a spiritual brace. Nature will often do the rest.

It follows naturally from these considerations that the place for the study of disease is in the laboratory. The subjects of the study here are animals in which the manifestations of the malady are as nearly as possible similar to those in the human body. Such investigations, to which it is now realized that physics and chemistry are absolutely essential, begin to bring the study of disease into the category of the fundamental sciences. It is clear that if humanity wishes to be rid of its ills it should place every facility in the way of laboratories, apparatus, and experi-

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mental animals at the disposal of able and honest investigators. Rich men, who set up laboratories out of altruistic or other motives, deserve to be pardoned by their less fortunate and consequently envious countrymen who denounce them as commercial brigands. And if a genius should arise in the land who could make anthropoid apes as plentiful, healthy, and cheap as guinea-pigs, monuments should be raised to him and his name should be sung in the epics of future generations. For it is natural that disease may be most advantageously studied in creatures that are closely akin, if not completely identical to the human being.

In résumé, it is unsound to consider the doctor as a scientist, in his relation to the patients, or to think of medicine as an independent science. The practice of medicine is something of an entirely different nature. It is to the greatest extent an art; it is partly craft; it begins to smack of a technology or applied science.

Its craft is important in surgery, which depends largely upon the same dexterity necessary to goldsmiths, pianists, wood-carvers, bartenders,

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watchmakers, carpenters, and sculptors. Its technology is important in the diagnosis and treatment of disease. Here the physician should always be on the alert to *apply* the discoveries made by the student of disease in the laboratory. But in doing so he should not consider himself a scientist. For, in diagnosing what ails a patient, he seeks to locate a hidden source of danger or annoyance in the body of the sufferer. To do this, it may be necessary to *make use* of discoveries, just as the famous detective Burns might employ a scientific discovery in hounding out a criminal who is a source of annoyance in the body politic. Yet no one would assert that Burns is a scientist. He is simply an excellent detective. The last and most important function of the physician is still his art, which consists largely in the emotional relationship he must bear toward his patient. In this, all good doctors, from Hippocrates to Osler, have been proficient. This is in its nature antipathetic to the scientific attitude. The less it is contaminated with science, the better.

As for the study of disease, that should be

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left to those intellectually curious and largely heartless individuals whose desire is incessantly to know, to discover, to find out the how of things. The best of them have scant interest in the malaises of patients; their curiosity concerns itself with the malaise in itself. Contrary to their own occasional pretension, and to the invariable description of them in newspapers and popular gazettes, their desire is *not* primarily to relieve suffering humanity. They are driven to their task by that strange instinct that gave rise to the impudent and dangerous explorations of Henry Hudson, and to the unholy and heretical probings of Galileo.

CHAPTER IV

T. G. H. AND THE SUPER-DOC

ONE of the most distressing tendencies in American medicine is the decline of the old-fashioned general practitioner, and his replacement by the modern so-called scientific physician and group doctor. This is sad, not because it will have a very perceptible harmful effect upon the average length of life or upon the general health of our countrymen. Indeed, it is possible that the services of the new physician may be, in some ways, more important than those of his predecessor. But there is cause to lament the passing of "old doc," because his going means the disappearance of a charming character, a wise counselor, a comforter in time of distress, a rock to cling to in the storms of disease and in the presence of death. His twilight must fill one with melancholy, because he was usually

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a figure of simplicity and sincerity and real dignity in our communities, which, God knows, are already more than filled with hypocrisy, charlatanism, loud advertisement, meretricious efficiency, pretense, vulgarity of all kinds.

The adorable figure of the doctor of the old type has been beautifully described by pens that put this one to shame. Oliver Wendell Holmes has painted the physician of the middle of the nineteenth century, Dreiser has characterized him admirably in his book, "Twelve Men." One of his type will remain, to the writer, an impressive and altogether unforgettable figure, who helped him through the annoying maladies of childhood, and advised him with priceless wisdom during the tortures of adolescence.

T. G. H. received his medical education in the early eighties at the University of Michigan, and settled down immediately afterward to practise in a village in the western part of that State. Here he remained for more than thirty-five years, as the principal physician and as a figure of importance, doing incalculable good among the villagers and the inhabitants of the surrounding

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country-side. His appearance impressed one instantly with confidence. He was stockily built and of middle height. His head and shoulders were massive and his jaw clean-cut and strong. He gave the impression of crag-like solidity and simplicity. His expression was ordinarily thoughtful and stern, but his gray eyes twinkled, at intervals, with understanding of human sins and peccadillos, and his rare outbursts of chuckling laughter were hearty and inimitable. He was religious to the point of fanaticism. Yet his long experience and keen observation of human frailties made him in many ways a tolerant and wise counselor. When the writer, troubled with the collapse of his religious faith through secret readings of Ingersoll and Darwin, came to him with a recital of his doubts, the good doctor, instead of denouncing free thought and science, replied with a history of his own youthful struggle with the eternal enigmas of life.

His ability in diagnosis was of the first order. It showed that combination of careful observation, long experience, and rare good sense that led one to consider his judgments to be intuitive,

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rather than to be based on memory of principles rammed into him in his college courses. He made little use of modern diagnostic paraphernalia. He was not acquainted with the technic of blood counts, Wassermann reactions, or determination of blood urea. He did not pooh-pooh at them as new-fangled. On the other hand, he seemed impressed with their importance. But one felt that he was able, by short cuts, to arrive at fully as sound conclusions as those gained by the aid of these elaborate and expensive tests. His apparatus of diagnosis consisted of a thermometer, a stethoscope, a few test-tubes and reagents for simple urinalysis. These alone aided his clear mind and intuitive judgment in arriving at diagnoses of astounding accuracy.

At the same time, he was never afraid to admit that he was baffled in the study of some obscure malady. This characteristic, so much a part of his fundamental frankness and honesty, added to the confidence that every one had in him. He was like old Skoda in his refreshing therapeutic nihilism. He was no peddler of yarbs and

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simples, but was, on the other hand, a firm believer in the power of nature to cope successfully with many diseases. He reminded his patients constantly of this fact, and disdained to take the credit for cures that the universal mother had herself effected. Accordingly, it may be imagined that he scorned the great majority of his quacksalving colleagues, who administered innocuous concoctions, and then took the credit to themselves if their patients recovered.

In addition to his merit as a diagnostician, T. G. H. was a general surgeon of more than ordinary ability, and was one of the first of the Americans to apply the principles of asepsis to his operations. These were performed, mind you, not in the immaculate and elaborately equipped operating-rooms of modern hospitals, but in the home of the patient, with a single nurse, and frequently only with members of the family as his assistants. Despite these handicaps, his record of recoveries would do credit to a modern surgeon who has all of the modern apparatus and a veritable retinue of helpers at his command. Yet he was charmingly modest de-

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spite his success. The writer recalls one of the good man's favorite reminiscences. When still young and rather inexperienced, T. G. H. was called hurriedly to a distant sawmill to attend the owner, who had been terribly injured in a buzz-saw. The doctor drove for miles through the country-side, and arrived to find the man in a dying condition. He did not hesitate, but performed on the spot a difficult shoulder-joint amputation, at that time a rare feat of surgery. The man recovered and lived to aid in the deforestation of Michigan for many years. The surgeon told this story with great gusto, but always deprecated his own part in the remarkable recovery of the sawer of logs. He insisted rather that it was the man's astounding toughness and power of resistance that enabled him to withstand an operation performed under such difficult conditions. He constantly preached the necessity to the surgeon of sound mechanical knowledge. He realized that the wielder of the knife is, in essence, a sort of glorified repair man.

This practitioner was tireless in his ministrations to his clients. In the old days, with a

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horse and buggy, more recently in a clattering, mud-spattered Ford, he was to be seen, early and late, in the streets of the town or on the abominable roads of the surrounding country-side. Called in an emergency from a distance, he invariably responded. He did not make preliminary inquiries into the prosperity of the patient. In regard to remuneration, his schedule was anything but rigid. Those who could do so paid well for his services; the less fortunate rewarded him as they were able, or not at all.

T. G. H. is dead, taken away too soon from a community that loved him and in the end killed him by its incessant demands upon his strength. General physicians of his extraordinary ability become more and more rare. Communities of the type that he served have now to be content with mediocrities or sixth-rate graduates of modern medical colleges. The more promising students are lured from attempting the difficult but useful life that was his. They cannot resist the temptation of the gaudy rewards of money and notoriety that attend the successful metropolitan specialist or consultant of to-day.

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The absorption of the best talent by specialties, consulting practices, and, finally, by that coalition of specialists known as the "group," is a phenomenon to be ascribed largely to the rise of modern surgery. Its augmentation of magnificence and importance is one of the most romantic occurrences in modern affairs. For, from his ancient association with barbers, the surgeon has climbed to an eminence of the utmost dizziness. He is the most prosperous of physicians. The general practitioner, who once scorned the knife as a weapon fit only for such humble persons as tonsorialists, is now at the beck and call of his former servants.

In the sixteenth century, surgeons in general were said by Clowes to be "shameless in countenance, lewd in disposition, brutish in judgment and understanding." They were recruited, according to the same author, from "tinkers, tooth-drawers, peddlers, ostlers, carters, porters, horse-gelders, and horse-leeches, idiots, apple-squires, broom-men, bawds, witches, conjurers, sooth-sayers and sow-gelders, rogues, rat-catchers, runagates, and proctors of spittle-houses." In

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short, the ranks of this now honorable craft were filled in ancient days by the very flotsam and jetsam of humanity.

Indeed, for many centuries it took a considerable amount of courage to practise as a surgeon, and the endless dismal succession of quacks and rascals is lightened only by the occasional appearance of men of talent and honesty, like Paré and Hunter. But with the discovery of anesthesia in America, and, what is more important, the application of Pasteur's researches by Lister, a great change began to take place. Lister proved that the application of the principles elucidated by Pasteur permitted of the exploration of the deepest recesses of the body with comparative safety. The chances of death by microbes introduced by the surgeon's manipulations became remarkably less. This resulted in a great decrease of the appalling amount of homicide perpetrated for ages by surgeons of all ranks. Diseases such as appendicitis, inflammation of the gall-bladder, various tumors, et cetera, can be dramatically cured by surgical intervention.

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The craft of the repair of the body developed with surprising rapidity, and it is natural that Americans, famed always for their technical ingenuity, should play a prominent part in the amazing growth of this now dignified occupation. Murphy, the Mayo brothers, Halsted, Finney, de Nancrede, and Cushing are only a few of our countrymen who have played a prominent part in the development of surgical technic. These men, whether specialists or not, were in the first instance general surgeons of great ability. What is more, they combined a wide general knowledge of pathology and diagnosis with their mechanical and manual skill.

The technic and methods of surgery are to-day things to admire and to wonder at. In the hands of honest persons, the craft is certainly one of humanity's most laudable boons. It is only the prostitution of this honorable and useful craft by an increasing horde of commercialists and unprincipled pirates that is to be deplored.

The success of the distinguished surgeons just mentioned stirred hordes of men of mediocre

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talent to attempt their emulation. Unable to master the wide field of knowledge covered so ably by these protagonists, the imitators began to specialize in the absurd manner of the physician-priests of the dynasties of the Pharaohs, who confined themselves to the treatment and butchery of strictly isolated organs or even went so far as to concentrate their supposedly beneficial manglings upon a single disease. What is still more foolish, the rank and file of the would-be wielders of the knife begin their specialization not after a comprehensive experience, but immediately following the admittedly insufficient four years in medical college and two or three years of hospital service. Their ignorance makes it impossible for them to take into account the intimate physiological relations existing between different parts of the body. They seem to be aware only of the appendix, or the gall-bladder, or the tonsils, or the internal ear, or the turbinated bones of the nose.

Each looks upon the organ, for the slashing of which he has developed a penchant, as his legitimate prey. It is a secondary consideration

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whether the part be healthy or plagued by a malaise. These specialists are inspired with a mania for indiscriminate incision. Some of them seem to believe that the general extirpation of certain appendages would result in an unheard-of salubrity for the human race. The useful services of superior men of the type of the Mayos naturally brought a commensurate financial reward. And it is this increase in the emolument of deserving surgeons that has led to the unrestrained absurdities and excesses of imbecility which are perpetrated by the rank and file of the wielders of the knife.

"Why slave as a general practitioner," argues the medical student, "when I can become rich and notorious by a wholesale removal of tonsils?" This opportunity for venality has inspired the most daring and unheard-of excesses of commercial brigandage, practised with the dignity and unction and respectability that allows it to flourish with hardly a word of protest. Operations are advised on the flimsiest evidence of their necessity. Frequently they are performed on healthy individuals. The case of a promi-

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nent surgeon of New York comes to mind. This medico was visited by a college student who had got into a hopeless mire of debt. The student's father was rich, but was disinclined to settle the obligations. The youth, therefore, in a fit of inspiration, consulted the surgeon, demanding that his appendix be removed, and advising that a bill for forty thousand dollars be sent to his parent. Half of this was to be the reward of the surgeon; the remainder was to be used in placating the wolfish creditors of the student. The surgeon readily agreed to the plan, performed the operation, and sent in his statement. The grateful father, happy that his son's life had been saved, gladly sent the forty thousand dollars in settlement of the bill.

This incident allows one to wonder whether the gild of surgeons has advanced ethically and morally beyond the status of the quackish runagates and bawds of the time of Clowes. These last performed their unspeakable herniotomies, pocketed their shilling, and remained in the gutters of humanity, where they belonged. But the surgeon just mentioned, not one whit less a

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charlatan than the ancient horse-gelder, receives *his* twenty thousand dollars, increases in magnificence and dignity, and rises higher in the regard of his colleagues and his clientele.

Another instructive example of astounding ignorance, if not of downright knavery, is a recent incident in a Middle Western city. Several patients in the most pretentious hospital of the town, who had just submitted to operations for the removal of the appendix, suddenly developed smallpox. Investigation disclosed that they had visited their physicians, complaining of symptoms which were actually premonitory signs of variola. The good doctors referred the cases to a surgeon, who declared them to be suffering from appendicitis. They were rushed to the hospital and operated upon without delay, not, as it turned out, because of a malaise of the useless intestinal appendage, but actually for smallpox! All of them recovered from this disease, and it would not be surprising to find the perpetrator of this piece of asininity solemnly advising the operation as a new treatment of variola.

The absurdities of specialization are becoming

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so palpable that surgeons begin to look about for some modification of their present status. They reason that if medicine has become so complicated and of so wide a range that an ordinary individual can master only a small section of it, the logical procedure would be the formation of an association of men with different penchants, who might coöperate in the removal of the organs and in the resulting occasional relief of our suffering citizens. They begin to realize, also, that the time required to perfect the technic of the operations leaves none for the study of the art of diagnosis. They rightly argue that it would be a step forward to perform their excisions upon persons, the exact nature of whose illness had been determined. This would be greatly preferable to the widely existing present practice of operating upon persons whose maladies had been cheerfully guessed at, either by the surgeon or by some satellite practitioner, with a shrewd eye toward the splitting of the surgeon's fee.

As a result of these sage cogitations, groups of specialists begin to spring up in the land. This

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group is essentially a business partnership of specialist surgeons, who associate themselves with an internist, or diagnostician. This last determines the nature of the disease, and distributes the patients, let us hope with impartiality, to the various operators. The diagnostician surrounds himself, in turn, with a body of henchmen, known collectively as "laboratory men." In large groups there may be several of these satellites, who are regarded a bit sniffishly by their chief, the internist, and who are beneath condescension by the surgeons.

The procedure then is roughly as follows: The patient appears before the internist, to whom he may have been referred as a last resort by some practising physician. The sufferer is examined thoroughly by the diagnostician, who causes an array of chemical, pathological, bacteriological, and radiographic procedures to be carried out by his corps of laboratory workers. These tests are important—and very expensive to the patient. The resulting data are now correlated, if possible, with the findings of the physical diagnosis, and out of this mélange of facts, which are some-

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times obscure and even contradictory, comes some kind of determination of the client's malady. The sufferer is then referred to the appropriate surgeon of the group, who proceeds at once to the operation. Fortunately for the business affairs of the group, it is frequently necessary to perform a series of operations upon patients, whom the various scientific tests show to suffer from a complication of diseases.

The effect upon the purse of a person finding it necessary to seek the ministrations of the group is devastating in the extreme. All of the various laboratory tests, the physical examination, the anesthetic, the nurse, the operation, are carefully charged for on the itemized bill. Frequently he emerges from the frying-pan of his illness, his life doubtless saved by the laudable co-operative efforts of this group of scientists, only to step into the fire of a load of debt which is almost insupportable.

The quarters occupied by these associations of experts are the very antithesis of the untidy, dusty, modest sanctum of the old-fashioned "doc" of other days, so charmingly sketched by

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Opie Read. "In this professional hut there was only one window, the glass of which was dim with dust blown from the road. The furnishings of the office were less than modest. In one corner a swayed bed threatened to fall, in another a washstand stood epileptic on three legs. Nailed against the wall was a protruding cabinet, giving off sick-room memories. The village druggist, compounder of essences of strange and peculiar 'yarbs,' might have bitter and pungent medicines, but old doc, himself an extractor of wild juices, had discovered the retching secret of the swamp. To go into his office and come forth with no sign of heaving was a confession of the loss of smell. Sheep-shearing fills the nostrils with a wooly dullness, but sheep shearers could scent old doc as he drove along the road."

Not so the offices of the modern group of specialists. Their suites of rooms are situated in magnificent office buildings. Frequently edifices of many stories are devoted to the housing of collections of stylish doctors. The central waiting-room bears little suggestion of medical affairs. It is fitted faultlessly in expensive and

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luxurious antique furniture. It has that "subdued air of elegance and refinement" so much sought after by those of our commercially successful countrymen who wish to shed their pristine vulgarities. Its walls are hung with portraits of famous medicos. Upon a central library table repose neatly arranged copies of the better and more sober type of American gazettes and there is a noticeable lack of the more vulgar type of periodical that diverts the moments of waiting in even the best barber shops. Around the walls are arrayed bookcases garnished with fat medical tomes and with endless ranks of bound volumes of medical periodicals.

The place is presided over by a businesslike yet discreetly sympathetic being, usually in a uniform suggesting that of a nurse, who combines the function of reception committee with that of telephone operator and maker of appointments. The remainder of the suite, which includes consultation- and examining-rooms minor operating-room, laboratories, ateliers for radiography and photography, has the same air

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of scientific austerity, of efficiency, elegance, cleanliness, and expensiveness. Especially of expensiveness.

It will be clear that the maintenance of an institution of this type is only to be supported at a formidable cost. The salaries of the staff and of such lesser lights as dentists, laboratory men, radiographers, nurses, technicians, bottle washers, librarians, office girls, telephone operators, char-women, add to the immense amount necessary for rent and equipment.

What is more, the Olympians of the group find it necessary to visit clinics in distant cities, to go abroad at not infrequent intervals, to maintain automobiles of an elegance suitable to their stations, to live in social *milieu* commensurate with their dignity and intellect. All of these things are necessary to the acquirement and maintenance of that prestige which has become an integral part of the character of the modern physician.

From this it naturally follows that the charges to the patient must be correspondingly enormous. The business organization of the group is usually

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conducted with a truly American efficiency, and with an impersonality and heartlessness so necessary to all sound economic enterprises. For it is this, in fact, that medicine is rapidly becoming. The high fees obtainable by the expert doctor have made medicine what it has seldom been in the past—a paying business. This materialistic element is essentially foreign to the spirit of the true physician. Like the functions of the educator and priest, that of the good doctor has been one of self-abnegation, of devotion to ideals. These ideals, which are necessary to a calling that should be altruistic and partly religious in its nature, have been rudely upset by the entry of economic enterprise.

It may be imagined that the services of these expert super-docs are accessible only to persons well endowed with worldly goods. The rank and file of us must be content with the ministrations of the more humble practising physician, who becomes less and less the idealist of the old days and, who represents now the mediocrity, whose lack of ability or personality makes im-

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possible his attainment to the dignity of the specialist. In addition to the rich, the services of the super-doc are available occasionally to the very poor. These he attends as a teacher in a hospital clinic. For the title of "clinical professor" is an important adjunct to prestige, and, by the same token, a business asset.

The affluence of the specialist has of necessity reacted badly upon the general practitioner, who finds his more wealthy patients deserting him for the medical experts. Hence, deprived of his most important source of income, he is forced to be less charitable to his less fortunate clients. Accordingly, it is natural that the ancient and praiseworthy spirit of altruism and economic negligence is being swept altogether out of the profession of medicine.

The inaccessibility of expert medical attention to the middle classes has led to the demand for the complete removal of the motive of gain from medicine, by its socialization. The writer recalls an eloquent plea for this step, made by a brilliant and disinterested professor on the opening day of the school year in an important medical col-

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lege. The reception of his cogent arguments by both students and faculty was anything but cordial. The majority of the undergraduates had apparently never given the matter any consideration whatever. The clinical professors, most of them luxuriating in outside incomes of an agreeable corpulence, were manifestly unimpressed by the forceful appeal. It is highly unlikely that any important step toward the socialization of medicine will be made in America for some time to come. Should certain foolishly visionary and idealistic individuals attempt it, the bitter opposition of the majority of physicians, and especially the super-docs, may be safely predicted.

The question remains whether this new alignment of the medical profession results in an improvement of service commensurate with its increased emolument. Certainly the refinements in diagnosis, the blood counts, pathological tests, metabolic studies, bacteriological examinations, X-ray plates, afford facilities unknown to the physicians of the *ancien régime*. On the other hand, the very presence of all of these aids leads

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the modern physician more and more to neglect the careful and essentially simple methods of observation and physical examination so notably developed by Laennec and Skoda, by Widal and Osler. The more heavily the physician leans upon the science of the study of disease, the more he is likely to neglect facts that might be directly and simply determined without an imposing and confusing array of modern gimcracks. The famous surgeon, de Nancrede, expressed these thoughts succinctly when he exclaimed, in an outburst of choler, "It is commercialism and science that are ruining medicine."

CHAPTER V

THE CURE OF DISEASE

IT has been recognized for a long time that one of the most serious errors in human mental processes is the tendency to reason in the manner of *post hoc, propter hoc*. Such reasoning assumes that when two events occur simultaneously or in sequence, one must necessarily be the cause of the other. Such ratiocination is met with every day. It is easy to cite numerous examples. For instance, during one of the years of the World War, America was visited by a great many thunder-storms and a large amount of rain. There was heavy bombardments in Europe, and it was concluded that these must be the cause of our excessive rainfall. This fundamental error in thought ranks with credulity in the perpetuation of medical mythology. It has been of fundamental importance in the creation

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of that bulky and absurd tome of officially recognized drugs known to doctors as the "Pharmacopœia." It has given rise to myriads of quackeries less respectable than those practised by official medicine men from the beginning of time.

Its importance in the perpetuation of a notion that a drug is efficacious can be shown by a simple example. Some nostrum is administered to a person suffering, let us say, from a severe belly-ache. Shortly after the drug has been applied, the dolor vanishes. It is natural to conclude that this amelioration has been brought about by the remedy. But this is by no means necessarily the case. Many other causes may have operated to cure the sufferer of his grievous pain, and when the nostrum is subsequently administered to a hundred other individuals with a similar number of annoying sensations in the abdominal region they may possibly continue to writhe in agony for many hours. This, however, does not matter in its consideration as an effective remedy. One physician, or one old yarb-mongering crone, or one quacksalver, has at one time observed the ache to disappear shortly after this drug was

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administered. And this suffices to incorporate it in the variegated and amusing therapeutic folk-lore for hundreds of years.

Turning to Garrison's history of medicine, one may find many amusing examples of the absurdities, not to say criminalities, to which this spurious logic has given rise. Some of these imbecilities, such as blood-letting, persisted throughout ages of time. Hippocrates, several hundred years before Christ, performed this operation in the belief that he was removing the evil humors which he believed to be the cause of disease. This nonsense was subsequently practised by physicians, on an always increasing number of ailments, for better than two thousand years. Sydenham, a famous English physician, applied this therapy, to some extent, in all of the diseases that he treated. Now, Sydenham ranks high in the regard of modern physicians, who almost universally venerate his memory. He is alluded to by medical historians as one of the greatest physicians of all time. Yet he completely lacked the critical spirit that would have caused him to inquire into the soundness

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of the practice of blood-letting. This famous medico entertained many other absurd beliefs as to the efficacy of various other therapeutic procedures. It is, therefore, difficult to discover just what constitutes his greatness, and why he is so venerated by physicians of the present day. Surely not because he had even a trace of the spirit of science, nor because he battled against the error of *post hoc, propter hoc.*

The excesses of blood-letting reached heights of absurdity that would cause great merriment to present-day readers, were it not for the fact that this practice has undoubtedly killed thousands of people who might otherwise have led long and possibly valuable existences. The blood was removed either by the operation of venesection or by the application of leeches. The traffic in these beasts reached stupendous proportions; in one year of the eighteenth century millions of leeches were imported into France. The persistence of doctors in this foolish procedure is one of the most admirable indices of their progressive, alert, and open-minded spirit. It was undoubtedly due in the

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first place to their credulity. Hippocrates, Galen, and other great physicians had advised their followers of its beneficial effects. Ergo, it must be valuable. Again, it was believed to be of merit for the reason that patients were frequently observed to get well after large amounts of their blood had been removed. It seems never to have entered the heads of even the most learned of healers that the sufferers might have recovered even more rapidly if nothing whatever had been done to them. It is curious, too, that when patients succumbed after this operation they were invariably said by their medical attendants to have died *despite* the application of numerous leeches.

This ancient and important therapeutic procedure was finally exploded by the Frenchman Louis. Like Harvey, Louis was one of those strange exceptions to the general numskullry that has apparently afflicted the medical cult from time immemorial. For some mysterious reason, he possessed the intelligence to question the value of this universally lauded treatment. He kept accurate count of the mortality rate in

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cases of pneumonia which had been treated by bleeding, and in those that were not subjected to this operation. His statistics showed that blood-letting had no appreciable beneficial effect. On the contrary, his carefully compiled data showed that it was actually harmful.

Many therapies even more bizarre, if not so harmful as this one, received official approbation of medicos for many centuries. The writer knows of no better humorous literature than that to be found in the "English Pharmacopœia" of the seventeenth century. One discovers, in this solemn and pretentious volume, that the lungs of foxes are very beneficial to people suffering from asthma. Vigo's Plaster, fabricated from viper's flesh, mixed with live frogs and worms, has a marked therapeutic action on many ailments. Moss from the skull of a victim of violent death is considered by the book to be a meritorious remedy. Human sweat, urine, and the saliva of a fasting man are alleged to possess important healing properties. The annoyances and harassments of dysentery are asserted to succumb to

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the ingestion of cat-ointment and oil of puppies, boiled with earthworms.

Happy to relate, these disgusting stews are no longer recommended in the official handbook of *materia medica*. They went out of fashion probably for the reason that the growing prudery and advances in the estheticism of clients tabooed them. Surely not because physicians proved that their use was not beneficial. None the less, their removal from official sanction is always alluded to by doctors as a great step forward in medical "science." They apparently consider that the substitution of myriads of chemical compounds for these wonderful stews is evidence of scientific advance, although it can be safely asserted that only fifteen to twenty groups of drugs in the entire *pharmacopœia* are of any perceptible merit. And the majority of these alleviate symptoms, rather than cure disease.

In the old days, it was the practice of doctors to administer enormous doses of every kind of drug to their unfortunate patients. The latter

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were purged until they were shadows of their former robust selves. Their agonies from the ingestion of copious drafts of emetics surpassed those of the worst sufferings of *mal de mer*. The gradual reduction of this generous dosage is often ascribed to the teachings of Hahnemann, the father of the homeopathic cult. This credit is frequently accorded to him, even by highly educated physicians, who otherwise sniff at and detest the doctrines of homeopathy. They admit, with an air of broad tolerance, that while the ideas of Hahnemann are unmitigated buncombe, still, his notions of the value of minute doses had a beneficent effect upon the scandalous therapeutic excesses of the accredited physicians of that time.

It is now admitted by every one of any intelligence whatever that the homeopathic doctrines are perfect examples of medieval scholastic flap-doodle. The value of homeopathic treatment lay in the fact that when patients were given "infinitely diluted" drugs, they were actually given nothing at all. And so nature was allowed to work its own curative effects, without inter-

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ference from the idiotic emetics, or purges to the point of death, that were so greatly relied upon by the so-called allopathic physicians.

It is possible that Hahnemann's absurd doctrines may have had some importance in the gradual amelioration of the ancient therapeutic asininites of the medical profession. On the other hand, it is likely that the common sense of rare individuals like Louis, and the disregard of drugging by great diagnosticians of the type of Skoda, were more important in the reform. Skoda, a Czechish physician, residing in Vienna, flourished in the first half of the nineteenth century. His delight was in diagnosis, that is to say, in finding out what ailed his patients. In this art he was a master of the rank of Laennec. But he manifested utter disdain for any kind of healing balsam. The moment he had ascertained the nature of the malady, his interest in the patient abated, and when asked by his underlings to give directions for treatment, he would remark brusquely that that made no difference whatever. To him one drug was as good, or as useless, as another.

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This contempt of drugging is called "therapeutic nihilism" by medical savants. It is still very generally frowned upon by the majority of physicians. In reality, in the light of what is actually known of the curative action of drugs, the nihilists are more nearly right than the incontinent prescribers of herb and clysters. For with the exception of a very few compounds that soothe pain or ameliorate symptoms, the entire pharmacopœia and the whole literature of favorite prescriptions might be consigned to limbo without any effect upon the salubrity of the human race.

Despite this fact, our nation is plagued with the existence of large and prosperous drug factories which pretend to be concerned only with the preparation of remedies officially recommended by physicians. It is true that these commercial organizations perform some service of value in the preparation of drugs such as quinine or digitalis and in the manufacture of biological products like diphtheria antitoxin. On the other hand, a large part of their effort is directed toward the elaboration of nostrums which they

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advertise assiduously, and with which they add to the state of confusion in which physicians already exist in regard to the cure of disease. The American Medical Association attempts to check this torrent of new nostrums. Its council on pharmacy and chemistry conducts a laboratory which examines into the validity of the new preparations. The ones which pass the tests are placed in a sort of appendix to the already hopelessly corpulent "pharmacopœia." This minor volume is called "New and Non-official Remedies," and is, in reality, a collection of respectable patent medicines. Despite the inhibiting influence of the council, these new concoctions, possessing, it is true, a merit superior to Peruna or the ancient oil of puppies, produce an endless unnecessary reduplication of drugs, and only thicken the fogs in which doctors are now groping aimlessly.

After all, it may be well that this endless drugging be permitted to continue. It may be best that physicians and their clients remain in ignorance of the fallacy of *post hoc, propter hoc*. For it is a commonplace of observation among

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doctors, some of whom may even be aware of the essential ineffectiveness of most remedies, that patients in general demand the administration of colored liquids or bitter herbs. Any honest admission of impotence in the face of a malady or of skepticism as to the efficacy of drugs would at once lower the medico in the esteem of his clientele. In a word, the majority of physicians believe that they cannot afford to be honest, and in this connection they are indubitably right. For no citizen would be so foolish as to reward a physician with hard-earned gold if he really knew that it was nature that had cured him and that the doctor had been merely a sympathetic onlooker.

What is more, it has been argued in a preceding dissertation that the mere presence of a sympathetic and optimistic physician is of great value to the morale and fighting spirit of the sufferer. And, consequently, if the afflicted one demands that the physician's attendance be accompanied by the prescription of some nauseous concoction, it is best that this gorgeous hocus-pocus be perpetuated. Hence it must be clearly

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understood that this discussion is in no sense a propaganda for the abandonment of these bogus herbs and simples. It is merely its intention to point out their essentially spurious nature. If it is healthy for our countrymen to be hoaxed, by all means let the befuddlement go on. At the same time, great respect is due to the honest physicians, always few in number, who war against such quackery by attempting to convince their patients that the battle is really between the body and the disease, and that the aid the doctor gives is to a large extent spiritual.

The conviction of the majority of persons that even the most ephemeral and innocuous of their aches and pains require active intervention has given rise to elaborate organization of quackery outside the medical profession. This is especially true in America. For our citizens, in addition to being the most gullible of peoples, are also undoubtedly more addicted to hypochondriasis than are the populations of the majority of European countries.

Two of the most amusing of these unofficial charlatanisms are those of chiropractic and

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osteopathy. They increase daily in wealth and importance. Their practitioners are allowed to assume the title of doctor. Their theories fly in the face of the fundamental knowledge that has been gleaned from the study of disease in the last fifty years. Chiropractors, for example, flout the idea that illness may be caused by microbes. They insist that our malaises are, one and all, due to the pressure of misplaced vertebræ on the nerve trunks leaving the spinal column. To correct such dislocations the athletic chiropractor subjects his victim to appalling buffets and maulings. And, since people believe that the more vigorous the intervention the more certain the therapeutic result, the chiropractor grows in dignity and affluence. The complete imbecility of doctrines of chiropraxis has no effect whatever upon their popularity. John Smith, who suffered from some inconsequential ache, consults the eminent D. C., is terribly thumped and banged, presently feels better, and logically ascribes his improvement to the rough treatment he has received. And, just as in the case of the M. D., with his tinted water, these rude buffet-

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ings may have had an indirect beneficial effect by aiding the mysterious and altogether obscure power of mind over body. Of this last, science knows nothing. But it apparently exists and is certainly of importance in the battle of the organism against its derangements.

Accordingly the accredited physician with his syringes and innocuous remedies, the osteopaths and chiropractors with their Dempseyish "rough house," the psychoanalysts with their Freudian gibberish, one and all play some part in the fight against disease. But it is important to remember that nine-tenths of the good they do is accomplished by a mechanism entirely foreign to their absurd beliefs and windy theories. And, while all of these cults have a modicum of value in certain cases, they also do a great amount of harm. They effect this damage by diverting people from access to a really rational and effective treatment of the small number of diseases that can be handled rationally and effectively. Thus the chiropractor who treats the child suffering from diphtheria by adjusting its vertebræ prevents the administration of the

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antitoxin which might really have saved its life. The osteopath who ignorantly massages the person suffering from mastoiditis prevents the saving of the life of the patient that the knife of the skilled otologist might accomplish. And the psychoanalyst who, ascribing a persistent and severe belly-ache to a neurosis resulting from a harmful sexual experience in childhood, endeavors to cure it by idiotic Freudian questionings prevents the necessary operation for appendicitis that might actually have removed the cause of the pain.

To sum up, all of the cults which flourish among us, faith-healers, Christian Scientists, psychoanalysts, osteopaths, chiropractors, the Corrective Eating Society, exploiters of Man's Divine Inheritance, occasionally may, like the wandering lithotomists and apple-squires of old, accomplish some indirect good. But their merit is enormously exaggerated by our citizens. These charlatans are sniffed at by authentic doctors. But it is true that the latter are the inhabitants of glass bungalows, and should have a care in which direction they hurl their destruc-

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tive dornicks. For, in reality, they accomplish the majority of their good in much the same way as the Camorra of quacks and fakers just mentioned and are only slightly in advance of them in knowledge and ability. This becomes apparent to any one willing to tear off the cloak of sacerdotal dignity that the medico almost invariably wears.

The mysterious power of mind over body has recently been subjected to a great deal of pretentious pseudo-scientific analysis by Europeans, Freud and Jung. Freud, using the methods of psychoanalysis invented by Kraepelin, has propounded windy theories on the nature of hysteria. These can be nothing but incomprehensible twaddle to any one who demands that a generalization rest upon accurately gleaned quantitative data. Yet the doctrines have been eagerly taken up by some physicians alleged to be experts on insanity, and have been widely applauded by many of the intellectuals of America. On the surface, it would seem astounding that persons supposed to be brainy should enthusiastically subscribe to this pompous

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nonsense. In reality, its popularity must be due to the importance ascribed by the theory to sexual experiences. One of the most prominent manifestations of American intellectualism is the revolt against the conspiracy of silence in regard to sex that characterized the Victorian period. Intellectuals have reacted with violence against these largely laudable conventions and pruderies which have helped to keep such questions properly romantic and mysterious. They insist upon dragging such subjects into the open. They give everything a sexual basis and sexual implication. The champions of Freud gravely announce themselves to be psychologists, though they know nothing of the quantitative science on which the small body of really valuable experimental science actually rests. They confidently apply their theories to those obscure problems of mental derangement which will certainly be the last to be solved by the slow systematic attack of the genuine science of the study of disease. Aside from the grain of truth contained in the ideas of Freud, the contributions to exact knowledge made by the promulgators of the Freudian

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cult are virtually nil. And the small amount of fact upon which the doctrine rests has doubtless been known for many years to alienists or even ordinary physicians who possessed common sense and an understanding of human nature.

Up to the time of the investigations of Pasteur, malaria and syphilis were the two diseases definitely amenable to curative agents. Mercury in its various forms was known to have a profound effect upon the manifestations of syphilis. Quinine, the active principle of Peruvian bark, had an undoubted curative action on some kinds of malaria. The treatment of malaria by quinine, though taken up by physicians, was in reality no discovery of theirs. It had been known to be valuable for centuries by South American Indians. Both of these therapies, indeed, rested upon empirical popular experience and were a part of the ancient folklore of the people. No cure resting upon the firm basis of the study of disease can be said to have existed before the time of Pasteur and his immediate followers. Following his discoveries, a way to the cure of certain diseases had been

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opened by the investigations of Roux and Yersin and of von Behring and Kitasato. The Frenchman discovered that the microbe of diphtheria, grown in pure culture, secreted a poison, which, when injected into animals, produced effects analogous to those seen in human cases of the disease. Following this, von Behring and Kitasato demonstrated that animals might be immunized to this poison. They began by injecting minute, non-fatal doses, and were able gradually to increase the amount of the harmful substances until, some weeks after the first injection, hundreds of fatal doses could be tolerated by animals immunized in this way. They then proved that the immune animals owed their resistance to the presence in their circulating blood of a poison-neutralizing principle. It was further shown that the blood of such immune animals could render the poison harmless when the two were mixed in a test-tube.

These investigators, believing that the evil effects observed in human diphtheria were due to the poison, reasoned that they should be able to combat the disease by the injection of the

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blood serum of an immunized animal. They gave the name of "antitoxin" to this immune serum. Their predictions were brilliantly vindicated, and it is now known that the mortality in diphtheria has been greatly decreased by the timely injection of antitoxic serum. Here is a definite instance of the conquest of a terrible disease. The terrors of the malady were removed, purely as a result of experiments upon animals in the laboratory. Great hopes for the extension of this work to many other infections were dashed by the discovery that the majority of harmful microbes apparently do not secrete soluble poisons of this nature. Up to the present, antitoxins seem to be therapeutically effective only in diphtheria and in some forms of dysentery, and prophylactically valuable in tetanus.

Efforts were made to obtain immune serums which might depend for their curative effect upon principles active against the microbe itself, rather than against its poisonous products. Some success has attended these efforts, which were indefatigably carried on by large numbers

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of investigators. A serum very effective against bubonic plague has been prepared by Yersin. One of marked curative action upon cerebro-spinal meningitis has been elaborated by Jochmann and Kruse in Europe, and later by Flexner and Jobling in America. More recently a certain type of pneumonia has been treated with some apparent success by the use of an immune serum. There are, in addition, suggestive indications that infectious jaundice and yellow fever may be treated successfully by the same procedure.

It is true that while the treatment of these diseases with specific immune serums was based upon preliminary animal experiments, at the same time the value of all of these remedies is not proved with the striking conclusiveness of that of diphtheria. This is due to the employment of statistical rather than experimental methods in the study of the effect of these serums upon human cases of the disease. This method of obtaining exact information, while sometimes of value, is open to many serious objections, especially when the immune serum is not suffi-

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ciently active to reduce the mortality from a disease virtually to zero. In order to be certain of the value of one of these remedial agents it is necessary to resort to experimental methods of the type described in the third chapter. That is to say, rather than depend upon the apparent reduction of mortality from a higher to a lower rate following a given treatment, it would be wiser to divide all available cases into two parts, treating one group and leaving the other to serve as a control, or check. Accuracy demands this procedure for several reasons. One of these is easy to illustrate. The mortality rate in a series of pneumonia cases might be 30 per cent. when they are subjected to ordinary treatment. It might be found that the rate in a series of cases injected with serum was as low as 10 per cent. From this, it is the custom, especially in American medicine, to conclude that the serum had effected an actual decrease in mortality. This conclusion is in reality not justified, since the two series of cases either are occurring at different times or are subjected to varying degrees of general care. It is possible, then, that the mor-

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tality from the second series of cases would have been 10 per cent., and not 30, even if no serum had been injected.

It has been pointed out that the application of the experimental method to human cases is little practised in America, for two reasons. First because the training even of so-called scientific physicians does not demand the rigorous accuracy of carefully controlled experiments. Again, a popular hue and cry would certainly be raised against hospitals known to withhold a treatment from patients who might *possibly* be cured by it. As one great American physician remarked, it would not be justifiable to withhold from any patient a remedy that *might* be beneficial and so save his life. But here, to speak colloquially, is the catch. It is, in the first place, necessary *accurately* to determine whether or not it is beneficial. For this the experimental method is demanded. This sentimentalism is short-sighted and foolish, and should be more vigorously combated by physicians, especially those who have pretensions to science. For accurate knowledge, based upon quantitative ex-

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perimental data, will be of greater benefit to humanity in the long run than will the muddled ideas that arise from the sentimentality and tender-heartedness of the present quasi-scientific studies.

When it was discovered that many infectious diseases were not amenable to treatment by serums, scientists in the study of disease cast about for new methods of conquering the enemy. This brought about a curious recrudescence of the ideas of Aureolus Theophrastus Bombastus von Hohenheim, who is better but less euphoniously known as Paracelsus. This interesting figure of the sixteenth century, part quack and noisy charlatan but with some of the laudable uncompromising iconoclasm of Servetus, asserted that the purpose of chemistry was the discovery and elaboration of substances that might cure disease. So little was known of disease at that time that his demands went unsatisfied for hundreds of years. But when the nature of infectious disease began to be elucidated by Pasteur and his followers, a figure arose, in many ways a sort of refined Paracelsus, who renewed

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the demands of the latter. This investigator, named Ehrlich, partly succeeded where his predecessor had failed. Ehrlich, who was an enunciator of largely empty theories and a coiner of pompous names and phrases, at least had the merit of being, in addition, an indefatigable experimenter.

At the time of the inception of his experiments, it was known that many substances such as carbolic acid, corrosive sublimate, formaldehyde, were destructive to microbic life. But it was impossible to administer these internally in microbic diseases, because they were harmful to the body as well as to the invading germ. Ehrlich, realizing this, proceeded to set out in search of drugs which might be comparatively innocuous to the human or animal organism, but might, at the same time, be able to deal fatal blows to disease-producing germs. Following a lead furnished by the work of Breinl and Thomas concerning the effect of an organic compound of arsenic, called "atoxyl," upon trypanosomes, Ehrlich caused numerous variants

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of this drug to be synthesized by chemists. These were then tested, seriatim, upon certain infections caused by trypanosomes and spirochetes. These experiments were, of course, conducted upon laboratory animals. Remarkable results were obtained with some of these drugs, and notably with salvarsan, or 606, now patriotically called "arsphenamin" in America. This drug has a strong therapeutic effect upon syphilis, probably occasionally bringing about its cure. Its action upon the tropical disease of yaws is still more devastating. It is furthermore of great value in recurrent fever.

This branch of the study of disease is called "chemotherapy" and has attracted the efforts of many workers during the last ten years. But aside from the first results of Ehrlich, the number of valuable drugs discovered by this neo-Paracelsianism has been very small up to the present, despite the expenditure of a vast amount of time and great sums of money. This is possibly due to the fact that these labors are pursued almost exclusively by the methods of trial and

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error. They are not so much examples of science as of the activities of our greatly respected and romantic Wizard of Menlo Park in his world-wide search for a material suitable for the fabrication of phonograph needles.

On the other hand, it is certainly possible that curative agents for important microbic diseases will be discovered, even by the expensive method of cut-and-try. The spirit of chemo-therapy is laudable at least to the extent of its insistence upon rigorous animal experimentation. This is a vast improvement over the confused and almost totally useless balderdash of the old *materia medica*.

Medical men can have little part in such activities. The complex compounds now being investigated require expert chemists for their synthesis. These have then to be tested by the student of disease in the laboratory, who is not in such a continual emotional state of enthusiasm for the recovery of his experimental animals as the physician necessarily *must* be for that of his patients. When the chemist and the student of disease have obtained suggestive and promising

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results, it is for the physician to attempt their generalization to human infections. In this attempt he is, of course, a technologist, not a scientist.

CHAPTER VI

PILLS MAKE WAY FOR PREVENTION

THE purpose of the medical profession is said to be the cure of disease and the prevention of its occurrence. It is possible in America, as well as elsewhere, to detect a growing air of sniffishness toward the pound of cure, together with an increased regard for the ounce of prevention. This is true of progressive physicians and advanced thinkers generally. The present vogue of preventive medicine is chiefly a product of the humanism that has resulted from the advance of physical science and the decline of Christianity. Modernism tends to put aside the worship of deity and to substitute for religion a supreme arrogance, a confidence that mankind can look out very well for itself and that it has no need of the chaperonage of mystical higher beings. Great publicists of the type of

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Wells have set forth eloquently the blasphemous ambitions that the possession of the new weapon of science has raised in the breast of the highest simian.

The same tone of defiance in the face of the inscrutable terrors and the evident limitations besetting all living things is to be heard in the voices of hygienists and preachers of public health. It is implicit in the later researches of Metschnikoff, who boldly demanded the extension of our biblically allotted three score years and ten. It is to be discovered in the ringing appeals of public health orators of the type of V. C. Vaughan. According to perorations of this kind, the purpose of the science of the study of disease is not academic but always utilitarian. Its aim is the conquest of maladies that have terrified man from the beginning of time. It proposes to lengthen the insufficient span of years now accorded to us. It hopes to bring about the production of a new race of healthy, efficient, happy, and upstanding men. Scientists in the study of disease are represented not to be animated by intellectual curiosity, but are supposed

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rather to be driven to their labors by a deep love for suffering mankind. This humanitarian spirit is not confined to the bacteriologist, chemist, epidemiologist, and engineer of the health army, but is ascribed, by some dextrous twist of rhetoric, to the medical profession as a whole. It is here that the pretensions of the guild rise to the highest pitch of fatuity. For the medical profession is said by certain public health orators to be the only one that works constantly, by its efforts in disease prevention, to remove the necessity for its own existence!

There can be no doubt that preventive medicine holds out the promise of the conquest of disease. The mortality rate from tuberculosis and typhoid, from yellow fever and Asiatic cholera is being reduced noticeably in many countries by the enthusiastic and untiring efforts of hygienists. The mean length of life is alleged to have been materially extended. Given a little more knowledge, a few more public health officers, a more efficient hygienic gendarmerie, a slightly more intelligent and docile citizenry, and there is no reason why any one should die from

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an infectious disease nor will any obstacle remain in the path of a grand, unparalleled, gorgeous, and stupendous proliferation of the human race.

So intimate the shouters for public health. It will be our task in the pages that follow to inquire whether such an event is desirable, and if so, to find out in whose hands the abolition of disease should be placed.

Is the widespread and unrestrained practice of preventive medicine desirable? Serious objections arise that would indicate that it is not. The writer brings these forward with considerable trepidation, realizing that he will be denounced as immoral, unethical, and antisocial by all forward-looking citizens. But the objections are valid and important and had best be faced now, rather than when the evils that they point out will have become irremediable. It is best to follow the advice of Huxley, who remarked that "there is no alleviation of the sufferings of mankind except veracity of thought and action and the resolute facing of the world as it is, when the garment of make-believe by which pious hands have hidden its uglier features is stripped off."

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The first objection to the continuance of the campaign of disease prevention is concerned with the question of the population of the earth. This has been increasing during past centuries at an astounding rate. Hygienists admit that their fight is already saving countless thousands of babies and adults who would otherwise die. Each new conquest of disease is heralded with joy and thanksgiving. Each new advance results in donations of further sinews for the war against disease. Additional progress may be looked for in the near future with a resulting augmented rate of increase of a population that is already too dense for comfort. The twin demons of famine and pestilence have been visualized as the eternal regulators of the amount of population on the earth's surface. These ogres, whose activities are in the long run beneficent, are now sorely beset by socialism on the one hand, and by preventive medicine on the other.

Humanitarians deprecate the bogey of over-population and hold that collateral advances in the production of the prime necessities of life

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will keep pace with the lawless and rapid increase of the *genus homo*. But there is a limit to raw materials and a maximum rate of production. It is entirely conceivable that the present augmentation of inhabitants may surpass those limits. In consequence, it is only a question of time before there will be great difficulty in supplying the necessities of all. What is more, the inordinate and rabbit-like fecundity of humanity results in other grave evils. The first is that of war. Socialists, pacifists, and humanitarians generally would do well to turn from their denunciations of emperors, capitalists, and secret diplomacy to an examination of this question. Nations like the Central Empires literally burst their bounds because of lusty, constantly growing populations. No arms congresses, no florid gestures by Mr. Harding or other great statesmen, no mawkish pretension to human brotherhood can prevail against the overflowing of such excessively philoprogenitive nations. It might be objected that war automatically restrains over-growth. This is not the case, for accurate statistical investigation shows that it does not kill

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enough people to counterbalance the always more densely swarming humanity. Again war, as at present practised, is very objectionable. It is an instigator of Bolshevism, which has frightened the better class of our citizens to the verge of insanity and threatens all of the organizations and institutions that we prize most highly.

Another evil of overpopulation is the alarming growth of the great municipal agglomerations. As the number of our inhabitants increases, little dispersion over the land is to be observed. On the contrary, the rural population shows a relative decrease, and the incessant human agglutination into stinking and tawdry cities goes on unrestrained. It is toward the perpetuation of these sweating multitudinous groups that preventive medicine directs its most vigorous efforts.

It has been remarked that humanitarians and socialists advocate changes in the system of distribution and increase in production to offset the grave problem of overpopulation. Hygienists of a more advanced outlook dare to suggest that the problem may be met by the deliberate limitation of offspring. This plan is officially indorsed

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and very prevalent in several European countries, but in America the movement still suffers the disfavor of clerics, particularly those of the Romish persuasion. Only recently, the police of New York City, constituting themselves the ex officio minions of their spiritual leader, the venerable and honorable Archbishop Hayes, succeeded in suppressing open meetings of the Birth Control Society. The propaganda receives the indorsement of a very few of the more daring hygienists, but it is still largely in the hands of a band of ladies of both sexes who derive much spiritual benefit and moral pleasure from a thorough consideration and never-ending discussion of its interesting and variegated technical methods.

It is in the discreet and unofficial education in contraception that the medical profession performs its most stupendous service to the public health and happiness. The great majority of physicians, when properly approached, offer sound advice in this matter for a comparatively modest honorarium. Thus contraceptive knowledge spreads rapidly throughout the upper strata.

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Its technique is discussed in camera by ladies of the better class. It is curious, amusing, and a little pathetic that this highly valuable and important function of doctors is the very one of which none of them boast. It is to be hoped sincerely that the wrath of the clergy will not intimidate physicians in their prosecution of this great and necessary work. In addition to these hygienic activities, medicos further aid the cause by *ex cathedra* encouragement and support of those medical specialists who interfere with the life process before birth but after conception. One of these savants, a friend of the writer, informs him that a large proportion of his lucrative and useful practice is referred to him by physicians in good standing, whose professional and ethical punctilio prevents their personal performance of this function.

It is regrettable in the extreme that it is impossible to bring about a complete inversion of the practice of limitation of offspring in America. In a word, the middle class and the plutocracy, which constitute the backbone of our

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national strength, should really be kept in ignorance of this technique, so that we might be favored by an increase of such sound and highly desirable stock. The proletariat, on the other hand, whose larvæ swarm in myriads on the fetid pavements of our cities, should be given compulsory and accurate instruction in the art of limiting families.

The second objection to the indiscriminate extension of the practice of preventive medicine is based upon its tendency to bring about the survival and subsequent multiplication of the unfit. The hygienist who organizes the efficient supervision of the milk supply saves the cretins, morons, and achondroplastic dwarfs, as well as the healthy and well-favored babies of the lusty middle class. This tendency of hygiene to inhibit the normal purgative methods of nature has been the subject of accurate mathematical analysis by the biometrician, Karl Pearson. Pearson concludes that the humanitarian hygienist unwisely opposes the mechanism of the survival of the fittest, by which nature has kept down a too

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great proliferation of undesirables. He contends that continued advance in public health may swamp us with a plague of defectives.

It is difficult to refute the objections of Pearson, and it is at present infeasible to prevent the multiplication of the unfit. This last could not be accomplished by the passage of marriage laws, since love, or the sexual instinct if you wish, laughs not only at locksmiths but even at legal prohibitions. Restrictive marriage laws would simply result in the replacement of legitimate cretins and imbeciles by illegitimate ones. Sterilization of undesirables by vasectomy runs afoul of a formidable and insurmountable wall of sentimental prejudice.

Just as the physical and chemical researches of men like Newton, Faraday, Helmholtz, and Van t'Hoff are inspiring events in the dark history of human bigotry and ignorance, so those of Pasteur and Claude Bernard, or Bordet and Loeb in biology and pathology are luminous and instructive. But the first-mentioned investigations, in themselves beautiful, have led to the hideous development of modern industrialism.

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Those of the biologists may result in a final choking of the world by a horde of fifth-rate and undesirable individuals. It becomes a commonplace of observation that humanity makes ill use of the achievements of its brilliant sons. It is not yet ready for the boons that science can confer. But it does not follow from this that the science of the study of disease should in any way be inhibited. As well argue that the study of ballistics in physics, or of the compounds of nitrocellulose or toluene in organic chemistry be suspended on the ground that their investigation promotes war.

Since the prosecution of science of all kinds is glorious and good but the application of its discoveries is at present unwise, it is necessary to concoct some plan that will insure the perpetuation of research but suspend for a time its practical application. Preventive medicine might, for example, be put down by drastic laws, and the funds now expended upon it diverted to the scientific study of disease. The results obtained, instead of being made available to society, should be kept secret, excepting from the qualified indi-

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viduals who are conducting the researches. Then, in case humanity should awake one fine morning to find itself with the ability to check its present irrational philoprogenitiveness, and to devise and execute a plan for the suppression of the breeding of the unfit, the bottled-up knowledge accumulated by the intensive researches of the scientific Ku-Klux might be uncorked for the benefit of the emerging superman.

It is realized that, while the objections to disease prevention discussed in the preceding pages are sound, it is impossible even to advise that their logical conclusion be put into practice. The race becomes more and more used to comfort, to physical ease, to the alleviation of illness and amelioration of pain. It can no longer sit resignedly by, contemplating fatalistically its ravishment by fearful plagues. It loses the stoicism, the fortitude, the ignorance, the sense of powerlessness before the scourges of God, so characteristic of the ancients. So we are forced to turn from the logic of the perils of preventive medicine to the faith that the wholesale saving

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of life by public health effort is for the highest good. From this point onward, the former point of view will be considered wicked, impossible, unethical, and antisocial.

This brings us to the second subject of the discussion; namely, to whom is the task of public health to be intrusted?

The principal rôle of preventive medicine lies in the control and extermination of infectious diseases. Scientists in the study of disease have dredged up many interesting facts in regard to the characters and habits of the nefarious authors of such malaises. They begin to learn something of the way in which microbes are transferred from diseased to healthy individuals. This, together with the study of the individual resistance of individuals to infection, constitutes a branch of knowledge which forward-looking doctors are pleased to call the science of epidemiology.

American medicine may be proud of the fundamental contributions of some of its sons to the problems of the eradication of disease. This work was animated by the spirit of self-abnegation and passion for truth that led the old Ger-

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man hygienist Pettenkofer to test the validity of Koch's claim of the discovery of the microbe of cholera by swallowing deliberately an active culture of the virulent organisms. This was the spirit of the American Theobald Smith in his researches in Texas fever and tuberculosis; of the army surgeons Reed, Carroll, Agramonte, and Lazear in their dramatic discovery of the mosquito transmission of yellow fever; of Reed, Vaughan, and Shakespeare in the deadly camps of Cuba during the Spanish-American War; of Gorgas in the brilliant sanitary achievement that made possible the construction of the Panama Canal; of Ricketts in his studies of Rocky Mountain spotted fever and tabardillo; of Noguchi in the discovery of the cause of yellow fever; and finally of Park, Williams, and Krumwiede, of the New York health department, who work devotedly and efficiently at the task of control of infectious disease in our metropolis, despite the fact that they have scanty material, are paid miserable stipends, and have to defer to the imbecile whims of the grafting and ignorant New York political magnificos.

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It is true that the majority of these workers were trained as physicians, but few of them had anything to do with the actual practice of medicine. They had turned from this field to that of the laboratory, to bacteriology and the study of immunity. Public health becomes less and less a thing in which physicians should meddle. It demands, rather, a man of the temperament and clear-headedness of the engineer, who is accustomed to think mathematically and who dwells in a region where the land-slides caused by his errors descend upon his own head. What is desired is a person trained in executive tasks, privy to the compilation and interpretation of statistics, au courant with recent knowledge in sanitary engineering, in epidemiology, in bacteriology. These requirements are unfortunately not possessed by the vast majority of medical graduates or doctors, for the practice of medicine is characterized by lack of intellectual rigor, by an ethic which forbids the denunciation of the blunders of colleagues, by the great value placed on "personality," by a blithe readiness to pass the buck and stand from under the avalanches

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caused by serious errors. Public health in its administration and technical prosecution is therefore an affair for engineers, bacteriologists, and mathematical statisticians. What remains for the medico in this field? To him may be intrusted the subsidiary but still important tasks of instructing the masses in the art of birth-control, and of diagnosis of the contagious exanthematous diseases.

The writer does not wish for a moment to imply that doctors of medicine should be *excluded* from the office of health commissioner. The possession of such a degree by a candidate should do nothing more than cause the committee of intelligent aldermen in charge of the appointment to examine his abilities with particular closeness.

Recent years have seen an enormous increase of public health work throughout the nation. The cause is championed by eloquent orators and expounded by able rhetoricians. Cities of the progressive type begin to devote significant portions of their budgets to the salaries of health commissioners, and to vie with one another in the

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installation of elaborate sewage systems and the construction of efficient water supplies.

In the early days in large cities, and up to the present in the majority of small ones, the position of health officer was politically delegated to mediocre physicians, ward-healers of the local Tammany, who needed to eke out their existence by the paltry stipend that was accorded to the occupant of this office. The activities of such officials are devoted to occasional smallpox vaccinations and to inane fumigations, which are now known to be of little importance. They earn their salaries by the tacking up of red, blue, or yellow placards on dwellings smitten with the various exanthemata that are still the necessary experience of almost every child. They make feeble efforts at the sanitation of dairies, whose owners are not sufficiently politically influential to say, "Hands off!" They assert quackishly that an epidemic is under control, when in reality it has burned itself out. Nobody could possibly have been more impotent to check the plague than these muddle-headed gentlemen, who resemble nothing so much as the Russian Tschi-

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novniks of the days of the Czar. They are clever in creating alarms when there is really no danger, so that they may have the credit of throttling epidemics that fail to appear.

Their inspections of the sanitation of schools are elaborate pieces of folderol. Since their positions depend upon the favor of powerful political and financial forces, they are seldom uncompromising in enforcing ukases which might interfere with the interests of their masters. Their knowledge of micro-organisms, whose efficient foes they are supposed to be, is confined to casual observation of photographs in text-books. They pronounce bacillus "back-sillus." If they have at their disposal a laboratory with a bacteriologist, they tend to use it perfunctorily or ignorantly, and have not the knowledge adequately to supervise its technique and methods. Being practising physicians, they are likely to show deference to the rich and to pay scant attention to the less fortunate.

In short, the typical small city health officer, and to some extent the gentlemen who fill this office in our pretentious agglomeration, are fre-

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quently politicians, orators, poltroons, and wind-jammers, whose salaries might better be devoted to municipal displays of fireworks or to monthly barbecues for the poor of the community. Their effect upon the incidence of infectious disease is virtually nil. Progress in replacing the retired or unsuccessful otolaryngologists, ophthalmologists, and obstetricians by sanitary engineers and doctors of public health is retarded greatly by the inexplicable theory that the occupant of the office should possess the degree of M. D. It would seem that these formidable letters have a cabalistic significance which causes the microbic authors of plagues and pestilences to turn up their toes and die at a wave of the hand of the owner of these magic symbols.

The intrusting of the health of our communities to physicians of the type just described leads to serious embarrassment and needless economic losses to our citizens. But the ludicrous picture presented by such persons is surpassed by that of officials who enthusiastically apply the more or less scientific data of bacteriology to practical epidemiology. Such misapplication is remindful

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of the assininities engaged in by physicians who make their diagnoses exclusively by modern biochemical tests. It is easy to find such instances in the field of public health.

Take, for instance, the problem of the human "carrier" of infectious disease. Bacteriologists have discovered that various diseases, such as typhoid, meningitis, and diphtheria, may be spread by persons who harbor the microbes of these infections but who are not ill themselves. They have either had the infection and recovered, or are the fortunate possessors of a natural resistance which makes it impossible for the organisms to invade the body in a manner extensive enough to call out visible symptoms of disease. It will be realized that such individuals constitute a menace to communities, since they harbor virulent organisms and are discharging these, in one way or another, upon many susceptible persons. The problem of the detection of such carriers is therefore of the first importance in sanitation.

In the case of the three diseases just mentioned, the detection of carriers is strictly an affair for the bacteriologist of extensive and accurate

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training. Of the three diseases, the problem is most adequately met in the case of typhoid fever, the organism of which is comparatively easy of detection. But in the case of cerebrospinal meningitis and diphtheria, the task is not so easy. Let us present an example of the public embarrassment that might result from ignorant and enthusiastic attention to the carrier problem.

A small city is stricken with an epidemic of diphtheria. The alert health officer of the town administers prophylactic doses of antitoxin to all school children who prove to have positive Schick reactions, and to such adults as will submit to the test. By some odd chance the families of the three plumbers of the town have been smitten with the disease. The good doctor swabs the throats of the healthy members of the family and finds by bacteriological examination of this material that all three of the plumbers harbor organisms which have the appearance of diphtheria bacilli. At least, he is so informed by his bacteriologist. The health officer then declares a quarantine of these households and places the plumbers in durance vile until such time as the

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noxious organisms shall disappear from their throats. He makes daily cultures. Each time the results are positive. The organisms persist. Meanwhile, the situation of the town becomes first trying, then embarrassing, finally desperate. Sinks are stopped up, pipes burst, and the resulting floods cause great damage; one child is scalded to death in its cradle by a flood resulting from such an accident. Bath-rooms, deprived of the attentive care of these indispensable mechanicians, fall into disuse.

The citizens become frantic. Meetings of protest are held. The release of the plumbers is demanded. But the health officer is firmly backed by the city administration and the *polizei*, and remains obdurate. Life in the town becomes more difficult. Sanitation grows impossible. Finally plumbers are imported at great expense from neighboring cities. They attempt, with the promptness and efficiency so characteristic of the gild, to repair the accumulated damage, but it has reached staggering proportions, and small progress is made. Meanwhile, the interruption of sanitation has resulted in the outbreak of

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dysentery, typhoid and paratyphoid fevers. The new plumbers are among the first to succumb.

The lamentable condition of the town has now been noised abroad. Additional plumbers are sought out, but refuse to come, even when offered princely sums. Life is disorganized. Citizens flee the place by night. Pestilence stalks abroad. Finally, the notoriety of the affair necessitates the intervention of the United States public health service, whose experts find, upon checking up the work of our zealous health officer, that the original plumbers are not carriers of authentic diphtheria bacilli. Their throats harbor *diphtheria-like* microbes, it is true, but test proves them to be non-toxin-producers, and hence entirely harmless. Such a calamity as the one just described is entirely possible, given a health officer sufficiently enthusiastic, ignorant, and backed by an adequate power for the enforcement of his dicta.

Public health activity should, if possible, be freed from the clutches of politicians whose obscenities make our municipal government the laughing stock of the world. The entanglement

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of public health with politics is one of the worst of the influences that retard it. For it is now comparatively easy to find efficient commissioners of health, since these individuals begin to be graduated in droves from the new schools of hygiene of our universities. But the difficulty in the way of their efficient functioning is that of the idiotic change of political power so frequently occurring in the majority of American cities.

The writer has a friend who is a particularly efficient health officer in a rapidly growing Middle Western city. He complains bitterly and with shocking profanity of the vicissitudes that beset him. At present he has rather a free hand in his activities. The majority of the city council and the mayor are in sympathy with his progressive efforts. He has been accorded a liberal budget, which he uses with breadth of vision and discretion. But he lives constantly in the fear of a return to power of the minority party, which proposes to make "economy" the slogan of its campaign. The Machiavellians, in order to keep at least partly their promises of a

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reduction of municipal taxation, threaten to slash mercilessly the budget of our health officer. His plans, the result of five years of educational activity, of oratory, of battling with ignorance, of intrigue, would be irretrievably wrecked if this party should come into power. Even now, in order to hold his hard-won ground, he finds it necessary to make friends with wealthy and influential men.

It is an interesting fact, which would certainly appear inexplicable to naïve persons, that the bitterest opposition to his efforts comes from the rank and file of the physicians of the city. These supposed guardians of our health look askance at his establishment of health centers. He has manned these with an efficient corps of young physicians, dentists, and visiting nurses, who give free advice and treatment to thousands of the school children of the city. The good doctors evidently fear for the safety of their lucrative incomes, and, because of this threat of a reduction of their munificence, are almost without exception on the war-path for the scalp of the commissioner. This, my masters, is the pro-

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fession which works constantly for its own extermination by its passion for preventive medicine! It is interesting and amusing to observe, on the other hand, that the struggles of this health officer receive the cordial support of the majority of the dentists of the city. Tooth-drawers are frequently sniffed at by doctors as commercial brigands and persons whose craft is only slightly superior to that of carpenters or bricklayers. But, brigands and carpenters or no, it is indisputable that their understanding and support of prophylactic activities is far more cordial than that of medicos.

The health commissioner in question would long ago have resigned in disgust were it not for his peculiarly warlike and stubborn temperament. In addition to the tenacity of a Gila monster, he possesses marked political sagacity. This he has gained from a realization of its absolute necessity to a successful prosecution of his work. Convinced of the value of his cause, he stops at nothing to insure the perpetuation of his efforts. He matches intrigue by counter-intrigue, and has succeeded until now in rolling

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logs of a greater weight than those of his opponents. He fights fire with fire.

But the strain of such effort is great. The ordinary duties of work such as his are sufficiently burdensome without other anxieties. The combination of these with his necessarily unrelenting conflict with the pack of quacks and commercialists seeking to upset him is wearing him out rapidly. When last seen by the writer, his former serenity was replaced by an evident nervousness and irritability. He looked gaunt and tired. He was ready to search for some place which might allow him to work uninterrupted and remove him from the constant opposition of enlightened medical colleagues.

There are, it is sad to relate, lamentably few men of his kind who, combining good training and exact knowledge with the warrior temperament and the uncompromising devotion of a religious zealot, still possess a sufficient modicum of jesuitical craft. The majority of efficient modern health officers will be quickly defeated in such a struggle. They will seek leisure for work which is divorced from the idiotic whimsies

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of political change in a field which offers economic security and continuity of effort. They will retire to the laboratory, or to the academic grove, or to foundations of the type of the International Health Board.

CHAPTER VII

RELIGIO SANITATIS

IT is evident that preventive medicine does not present the great opportunity for the mythology so common to the healing art. The practice of public health rests upon the science of the study of disease, and its principal accomplishments are direct applications of that science. What is more, investigations which may quite properly be called scientific have been occasionally performed by hygienists. The preceding chapter has discussed the distinguished achievements in preventive medicine made by American protagonists of this branch. On the other hand, its entanglement with the obscenities and imbecilities of politics, and the opposition of many practicing physicians to it, are influences that have retarded its development.

Another and more grave evil threatens to

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vitiating still further the superb efforts of its Nestors. This danger arises from the wave of moral fervor and the spirit of social uplift that is at present one of the salient phenomena of American life. This spirit is the manifestation of a new exacerbation of Puritanism. In former days, Puritanism was closely identified with the more violent and fanatical manifestations of Christianity. It has had alternate periods of recrudescence and defervescence, depending upon the vicissitudes of that admirable religion. But now it draws away more and more from its entanglement with the true faith and seeks alliance with the cause of public health. Its roots are still, as of old, a sullen envy of the "fellow who is having a better time," as pointed out in the penetrating satires of Mencken. But this fellow who has a better time is no longer condemned as a transgressor of the laws of God: he is looked upon rather as an offender against the new sacred laws of health.

The neo-Puritan exponents of public health frown upon the bacchanalia that are as old as the life of man. These festivals are without doubt

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expression of his joy in life, and are the symbols of a gay and impudent nose-thumbing at the irrevocable and cruel tragedies of senescence and death, the implacable ironic enemies of human kind. The Messiahs of sanitation forget that such carnivals were very prevalent in the healthy Dionysian periods of Greek civilization. They ignore the mighty achievements and incomparable salubrity of their Norse, Danish, and Saxon forefathers, who drank lustily all night and fought valorously the next day. They deprecate the importance of the fruit of the vine in the productive and creative activities of old France. They refuse to consider the beer-bibbing that went hand in hand with the Teutonic creation of the priceless treasure of music. So now they attempt to suppress the normal and pleasant worship of Bacchus with the implacable fury of Savonarola. These fanatical activities of the modern apostles of health find an almost exact parallel in the crazy hatred of all things beautiful manifested by the priest of Florence. The weapon with which the modern Puritan seeks to slay beauty and destroy gaiety is the same one

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that was so effective in the hands of the insane monk. This implement is the weapon of fear. Savonarola, in the name of Christ, threatened with the eternal fires of hell, all those who worshiped Bacchus or winked an eye at the white she-devil. His modern followers, knowing that the belief in an endless roasting goes out of fashion, employ the bogey of sinister maladies which follow various intemperances in this life. It is true that commercial evangelists like Dr. Sunday still befuddle simpletons with the slogan "Get right with God," and throw them into a panic with lurid pictures of the lake of brimstone. Some Presbyterian, Methodist, and Baptist clerks of God still exist who shriek hell-fire in their jerry-built temples. But the great majority of the reformers, cleric and lay, now use the frightful apparition of disease, calling to their aid an armamentarium of supposedly scientific evidence that awes and frightens even reasonably intelligent members of our communities.

The male and female beldames of the new religion of health use, for the advancement of their own aims, the prestige that hygiene has

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earned by really sound achievement. They tell of the conquest of yellow fever and diphtheria, and point out in the next breath that the same knowledge proves the horrors of whisky. This fervor for a health resulting from abstinence from all things gay and pleasant has been erected by them into a *Religio Sanitatis*. Its inspiring figure is the chaste teetotaling American young man, who shuns all evils of the flesh, and who, because of this sobriety, grows hugely successful in his cheesemongery and eventually wins the heart of the beautiful daughter of a rival chapman. With a missionary spirit common to all successful religions, this American is being held up as a model to the entire world. His emulation is being advised to all races, with a naïveté and assurance that make us the laughing-stock of civilized peoples. Now that the liquor traffic has been dealt a deadly buffet by the Eighteenth Amendment, and since the worship of Aphrodite outside of the familial bungalow has been made perilous by the Mann Act and the house-carls of the vice-squad, the apostles of the faith look for the conquest of these evils in foreign lands.

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We hear the slogan, "A dry universe by 1930." We see sixth-rate evangelists of the stamp of Pussy-foot Johnson impudently meddling in the affairs of England, whose concerns should surely be her own.

Carnality and alcohol disposed of, the forces of the health crusade gird themselves to war against the sins that remain to us. Large funds are already subscribed toward a campaign to rid our land of the noisome stench of pipe, cigar, and cigarette. The pseudo-scientific evidence used as a weapon in this campaign is still more foolish than that employed in the attack on the other evils. In an important tract against the use of tobacco the penetrating researches of a scientific lady of the South are given a prominent place. This *femme savante* ground up a cigarette-paper in water and injected the resulting suspension into a mouse. The unhappy beast succumbed in a few seconds with violent convulsions, thus proving that cigarettes are harmful to the growth of small boys and deleterious to the health of our manhood. The discovery of *acrolein* in cigarette-papers by the

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great scientist Edison, whose name carries with it a papal prestige, is heralded as a definite proof of the noxious effects of the coffin-nail. The use of such evidence is reminiscent of an amusing incident that occurred recently in Belgium. The physiologist, Eger, was demonstrating the evil effects of alcohol to the workmen of a great industrial plant. He placed some guinea-pigs before this throng and either fed or injected the little animals with alcohol. They succumbed in a short time. The scientist, seizing the dramatic opportunity, shouted, "And this proves——" He hesitated, as one of the unfortunate beasts turned up its toes. "That alcohol is bad for such little animals," interposed a quick-witted working-man. The interruption reduced the demonstration to absurdity. The séance dissolved in mirth. The workman, though no scientist, had really pointed out an important error inherent in experiments of this kind. For it is a commonplace of pharmacologic knowledge that what is poison for the gander is not necessarily harmful to the goose. A substance causing the tragic demise of a mouse might have no serious effect

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when subjected to combustion in the snipe of the street urchin.

The missionaries of health are certain that the tobacco evil will follow that of alcohol into its approaching oblivion. If smoking cannot be exterminated, they mean to see it confined to clandestine practice behind lowered curtains and locked doors. The discreet culture of small tobacco plots will then be added to the fascinating evils of the secret alchemy of the home brew. Portly bourgeois deacons and upright citizens, who now go forth to gather dandelions in the dusk, will add the care of tobacco gardens to their illegal agricultural activities. The sale and smoking of tobacco having been made illegal, householders will gather in secret conclave before fireplaces supplied with forced draft, and carefully exhale the forbidden fumes into tall flues, so that they may escape the clutches of the sharp-sniffing yeomanry of the law.

But there are further crimes against health awaiting the assault of these zealots for the salubrity of their fellow-men. The consumption of tea and coffee will doubtless be made the next

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subject of attack. The rumble of the artillery preparation for this campaign is already audible. This spring in a health parade of children on Fifth Avenue in New York banners were carried displaying the malignant nature of these beverages, and at the same time extolling the virtues and delights of milk. Such is the mad pursuit of perfection now practised by the lunatic fringe of the health army. They will keep from an impressionable youth, at all costs, the knowledge that the glorious fighting of their Frankish and Frisian forebears, the adventures of vikings, the grueling work of former centuries, were performed with the aid of good ale or mead. Or that the feats of arms and exploration of more modern times have been made possible by sound rum, or strong tea and coffee. For them, away with such dangerous stimulants, and down with the incomparable exhilaration of combat, of exploration, of struggle to the limit of endurance. For them, we have come to the age of moderation, to the time when passions of all kinds must be held in leash, to the era of the milksop superman. The stop-and-go, the safety-first, the

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watch-your step, the keep-off signs of to-day, are raised against every desire and instinct that has given color to life, and that has mitigated a little the essentially tragic lot of mankind.

The charge has just been made that the horde of fanatical health reformers has called to its aid the supposed facts of hygiene and has unjustifiably used the alleged scientific data of preventive medicine as weapons of fear in the campaign for the crushing of the more sprightly and playful aspects of existence. It is necessary to support these charges by suitable examples. The use of alcohol as a beverage is condemned by preachers, evangelists, Chautauquans, by professional temperance lectures, hygienists, Y.M.C.A. secretaries, by school-ma'ams and Sunday-school superintendents and other housecretes of the vice crusade. The gist of these unending harangues is that its moderate or excessive use causes many serious maladies, and that the progeny of alcoholic parents are defectives, degenerates, epileptic, and often insane.

Their statements rest largely on the erroneous knowledge that results from the employment of

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the method of *post hoc, propter hoc*, described in a preceding discussion. Thus, a pathologist permits a necropsy upon the body of an individual who is known to have been a notorious drunkard. The operation of the uncritical and credulous prosector reveals that the unhappy creature had suffered from cirrhosis of the liver. Ergo, concludes the pathologist, the cirrhosis is the result of the unfortunate individual's potations. A whole literature has accumulated, in pathology, around the so-called alcoholic cirroses. A distinguished American pathologist does not hesitate to differentiate between two varieties of the disease, one due to indulgence in gin, the other caused by the guzzling of beer. It is now known by sound investigators in pathology that there is no direct proof that alcohol causes this disease. It is pointed out that the former observations took no account of the many cases of cirrhosis to be found in teetotaling archdeacons, nor of the myriads of hopeless sots whose livers were the very pictures of healthy soundness. What is more, the investigations of Friedenwald, who endeavored to produce this disease experi-

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mentally by the administration of alcohol, have failed to establish connection between the two.

Again, the henchmen of temperance assert that alcohol is the chief cause for the persisting necessity of insane asylums. Indeed, it is stated by some that alcohol is the principal cause of insanity. These supposedly sound data are culled from the doctrines of uncritical psychiatrists. The latter have been forced to withdraw from their position by the work of Clouston, who finds that people do not become insane because they drink, but engage in excessive bibbing for the reason that they already have a hereditary tendency toward insanity and so lack certain inhibitory powers common to the ordinary run of individuals. It is insanity, then, that really causes the excesses of alcoholism, rather than the reverse as the janizaries of health would have us believe. There is no indication that these minions will present the right side of the shield to our view. They have taken it into their heads that people go crazy because of alcohol, and prefer to persist in their false preaching, rather than to yield honestly and gracefully to the undeniable

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facts which cause their case to collapse. The misfortunes of every one known to be bibulous are laid at the door of alcohol. They say nothing of the thousands of hearty and hale oldsters, living far beyond their allotted span, and known by every one to have been lifelong sots of the worst variety.

The writer would be the last to admit that excessive indulgence in *spiritus frumenti* might not bring certain individuals to grief. Delirium tremens is undoubtedly its occasional result. Certain individuals exist to whom alcohol is probably very harmful. On the other hand, innocent young girls have perished horribly from excessive indulgence in ripe olives or marshmallows. It should be valid, then, on these grounds to clamor for the prohibition of such dainties, universally known to be laudable foods when indulged in with discretion. It is possible that there are persons with maladies which physicians know to be affected unfavorably by alcohol. Doctors wisely advise such sufferers to abstain from its use. But it is well known that diabetics should not indulge in sugar. It would then be rational

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to abolish the sale of sugar, on the ground that these diabetics will undergo an untimely demise in case their craving for the sweet should overcome their powers of self-control.

The scientific basis for the charge that alcoholics are the parents of degenerate offspring is of a soundness equal to the one asserting that liquor causes numerous diseases. It is a common belief that the children of chronic inebriates are often defective. What is more, it is generally supposed that the offspring of parents who were drunk at the time of conception are likely to show various deplorable stigmata of degeneracy. The second idea is less credible than the first, since, after all, drunkenness may be a very transient condition, which passes off rapidly leaving no trace. Yet it is solemnly taught in a certain reputable course in pathology that even a temporary alcoholization of the parents has a deleterious effect upon the germ cells, and so undoubtedly causes damage to the resulting offspring. A student who took exception to this doctrine was severely taken to task. Doubtless the good professor considered his questioning

pupil as hopelessly immoral and an enemy to society.

In reality, the idea that drunkenness at the time of conception results in degenerate offspring rests upon no experimental foundation whatever. It will be many years, without doubt, before the race will be prepared for such an experiment, at least upon a scale sufficiently large to yield important results. Imagine, if you will, the mixture of levity and horror that such a research would arouse, if it were proposed at the present time. Having no experimental basis, the notion actually comes out of the folk-lore of human beliefs and is of a dignity comparable to the ancient credos concerning elves, sprites, and the skilled dwarfs who cunningly fashioned magic armor and forged enchanted swords. Recently Bezzola claimed that the proportion of defective children conceived at the time of universal inebriety attendant upon the Swiss vintage is far greater than that of degenerates resulting from the conceptions of normal times. This observation would seem to be of value to the orators of prohibition. But they omit to enlarge upon the

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directly contradictory results of Ireland. This investigator compiled similar statistics in regard to the seasonal bacchanalia of Scotland, and found no increase whatever in the proportion of defective children that were the fruit of these festive occasions.

The notions in regard to degeneracy arising from chronic parental alcoholism rest upon still more flimsy foundations, and, in the light of certain excellent statistical researches, are also to be relegated to the interesting, gay, but inaccurate body of human folk-lore. A careful biometrical investigation was made in regard to this question by Elderton and Pearson, of the Francis Galton Laboratory of London. So far as can be discovered by discreet inquiry, neither Miss Elderton nor Dr. Pearson are persons of doubtful sobriety, nor do they own shares in distilleries, breweries, or wineries. Yet their elaborate mathematical investigations clearly show that the proportion of sound children is just as great among the families of chronic alcoholics as in the menages of the most bigoted and bluenosed teetotaling dissenters and nonconformists.

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Hygienists, whose business it seems to be to credit any evidence that alcohol is a most harmful and noxious substance, pay scant attention to the accurate biometrics of Pearson and his students. This is not surprising, since the results of these disinterested researches do severe damage to their theories, or, it is more accurate to say, to their religion. The most widely used American text-book of hygiene relegates the Elderton-Pearson report to a foot-note in the 1913 edition, and omits completely to mention it in the 1920 edition!

A considerable amount of work has been devoted to this subject in the field of animal experimentation. Here the results are conflicting. The foe of intemperance may, and usually does, cite one set of results. Doubtless the brewers and distillers are equally fond of using the contradictory researches in *their* arguments. But it is the intention in this discussion always to present both sides in the most impartial and fair-minded manner possible.

The most prominent of the investigations of this type are those of Stockard and of Pearl.

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Both of these researches appear to be adequately controlled. Stockard used guinea-pigs as his experimental subjects. He found that when adult animals of this species were subjected to long-continued alcoholization and were subsequently mated, the offspring were fewer in number than those of the sober controls. In addition, the young that were born to the inebriates were subject to a higher post-natal mortality. What is more, those that did survive were prone to be ill-nourished and to suffer from epileptiform attacks and other nervous derangements. In brief, the drunken guinea-pigs were the parents of inferior and ill-conditioned shoats. These results occasioned applause in the camp of the missionaries of health, and were, like those of Bezzola, widely used in propaganda.

Pearl, on the other hand, employed chickens in his research. This investigator, like Stockard, found the number of chicks hatched from the eggs of alcoholics to be fewer than those from normal fowl. But, to the confusion and consternation of prohibitionists, the chicks who survived, despite their bibulous ancestry, were ac-

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tually superior to the normal ones in eight out of twelve of the hereditary characters susceptible to Pearl's careful quantitative measurements. This scientist was forced to the conclusion that alcohol undoubtedly had an effect upon the avian germ-plasm. But it was really a salutary one, in that it apparently kills off the weaker germ-cells, allowing the hardier ones to develop and thus give rise to superior hens and roosters. This result was probably gratifying to all intelligent wine-venders and saloon-keepers.

Now, it is evident to those experienced in biological science that neither of these researches can be generalized to human beings. Once more, what is sauce for the gander is not necessarily palatable to his feminine relations. The writer, in discussing this question with a well-known pathologist, was confronted with the fact that guinea-pigs, as mammals, are more closely related to humans than are chickens, who belong to the phylum of birds. This being true, said the savant, it would be more proper to employ the findings of Stockard than to cite those of Pearl. But the moral pathologist was baffled upon being

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The plan that would then be put in operation would be the compulsory alcoholization of all young married people, at least those who confessed to philoprogenitive ambitions. The result, possibly, might be the production of fewer babies, but of more bouncing physique and far greater intelligence. If this occurred, and if the plan were kept up, the objections to the practice of preventive medicine discussed at length in the sixth chapter would be immediately nullified.

The remaining arguments of the opponents of the rum demon are not on hygienic grounds, and it is consequently out of place to subject them to analysis in this discussion. They need only be mentioned with comments which the writer finds it impossible to suppress. One of them concerns the greater efficiency displayed by our now sober slaves of industry, or, if you please, free American working-men. It is a commonplace of observation that an inebriated spoke-setter cannot construct an automobile wheel with the speed and éclat that one admires in his sober colleague. Efficiency is certainly one of the most important deities on the American household of Olympus,

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and his votaries are right in joining the ranks of the antagonists of the corner gin-mill. But efficiency is of little moment to those disreputable ones who set high store by lusty and innocent ribaldries and roysterings and by colorful dreams. Better, say they, a merry and forgetful world, than a hard, bright, efficient one.

The knights of the health crusade who have followed this immoral argument thus far are probably few. Surely all sound and devout priests of health have dismissed the dissertation in disgust. Let them regret having done so, for the writer admits his capitulation before a last potent stroke, which is delivered, not by the sword brain-biter of preventive medicine, but by the bladder of sentimentality. Alcohol has a brutalizing effect upon the fathers of families. It is true that many of these drunken varlets belabor their faithful spouses dreadfully and often neglect their children. This argument, after all, perhaps justifies an even more vigorous campaign than that which rages at present against this evil. Only let it be remembered that the fumes of drink are occasionally of anesthetic

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effect upon the grievous hurts resulting from the thumps of well-directed rolling-pins, skilfully wielded in the never-ending war of the sexes.

Hygiene devotes itself also to the question of sex and the venereal peril with a fervor that just now exceeds that displayed against the evils of rum. Too much is heard of this question on all sides. It is jabbered about voluminously and idiotically in the educational lectures of the Y. M.C.A.; it peeks leeringly out in the plays and novels of Greenwich Village; the pompous theories of Freud revolve around it; it is the leading theme of interest in woman's clubs, sewing-circles, and in the Sunday-schools of advanced and enlightened churches. This blushful subject is discussed with a pretense of scientific learning or as health propaganda. But it is not the science or the concern for national salubrity that really animates it. Rather it arises from those vicariously sexual impulses of people who, as some one has salaciously remarked, *think below the belt*. Surely it would be better to return, either to the silences of the period of Victoria the Good, or to the offhand frankness of the fire-

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side conversation of Queen Elizabeth. Or, perhaps, better still to the amiable obscenities of old François Rabelais, who alluded to the subject frequently but always facetiously, considering it as an apparently essential but certainly jolly aspect of our fundamental animality, and not as a matter for fearful threats by sex-lecturers or quasi-scientific chattering by Freudians.

The beldames of the uplift and the amateur sex-hygienists are aided in their educational, coercive, and police activities by men of considerable reputation in the science of the study of disease. One of these persons is a distinguished professor in one of the leading medical schools of the nation. He lectures the length and breadth of the land. He uses without scruple the weapon of fear. He proposes to suppress the youthful sowing of wild oats by augmenting the phobias that already so greatly inhibit the gaiety and kicking-up of heels that is natural to young people. He paints ghastly pictures of the evils of venereal diseases. His descriptions are vivid, nauseating, horrible. It is common for many of his hearers to faint, and it is said that a band of

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bouncers are held in readiness to remove these unhappy ones. He maintains that pre-marital chastity is the sole alternative to the horrors of venereal infection, but, as if realizing that it is necessary to mitigate such a harsh dictum, he slyly asserts that self-abuse does not have the evil effects that are supposed to attend it. This amounts really to advising young men that it is better to be onanists than to burn, to paraphrase the dictum of St. Paul! Such scandalous admonition is accompanied by a deliberate misstatement of the truth: to wit, that venereal prophylaxis is not to be depended upon.

This is an utterly false assertion which has been refuted by the experiments of Metschnikoff and Roux, and by the experience of all armies and navies, where prophylaxis is properly applied. The whole sex-hygiene campaign is, to tell the truth, an affair of empty rumble-bumble, carried on by a Camorra of essentially foul-minded Puritans. The venereal diseases are undoubtedly fearful plagues, but prophylactic methods exist which, when adequately and promptly used, are of almost perfect efficacy in the hands of per-

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sons of even mediocre intelligence. It is to careful instruction in the technique of their application that hygienists should confine themselves, and not to the peddling of smutty twaddle that frightens many of our already too docile youth half to death. Let parents, holy clerks, and, best of all, the young man himself, engage in the development of his moral fiber. This is not the province of preventive medicine. Nor is it the function of public health to distort scientific fact for moral ends.

Such perversion of the true function of preventive medicine by fear-mongers and health-messiahs does much to nullify its otherwise valuable efforts. Such distortion and misappropriation of facts as those just described must inevitably shake the confidence that our citizens rightly have in some of its other functions.

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mand of conversational French, so that, when his neighbor at the table remarks, "*Il fait chaud aujourd'hui, Monsieur,*" he will not respond by obsequiously passing the horse-radish. It is evident that the acquisition of such a vast body of irrelevant and unrelated knowledge requires several years of preliminary college training.

The apostles of the necessity of broad culture are opposed by educators who are convinced that the basis of medicine is now scientific. They count the ideas of the whoopers for broad culture as amiable bosh, and insist that the three or four years of preliminary training of the medical aspirant be devoted to science, rather than to the acquisition of high-sounding nonsense. In short, he should pursue mathematics at least through elementary courses in the differential and integral calculus, he should have a thorough grounding in quantitative, organic, and physical chemistry. In addition, he should have some schooling in the rudiments of botany and zoölogy, and should be cognizant of the mysteries of comparative anatomy. Of course, it is clear that the thorough pursuit of such scientific studies would

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leave small space for the acquisition of the humanities and cultural branches.

Between these two opposing camps stand those who desire to compromise. These educators wish to combine the study of scientific and cultural subjects in a two-, three-, or four-year pre-medical course. This idea is probably at present in the ascendancy, despite the fact that it is manifestly impossible to receive thorough training in either of these two fields in so short a time. In fact, the extraordinary development of physics and chemistry in the last decades makes it imperative to devote at least four years to their study, together with preparation in the mathematics necessary to their comprehension. It might be possible, in addition, to allow a small amount of time for the acquisition of a suitable amount of scientific French and German. So it is evident that the attempts to teach both culture and science in the few years devoted to a college course are futile and can lead only to a fragmentary knowledge of both.

Finally, there is a decreasing number of practical medical educators who consider the acqui-

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sition of both science and the humanities to be a silly waste of time, and think it better that the eighteen-year-old boy, fresh from high school, plunge at once into the mysteries of anatomy and physiology. These persons no longer voice their ideas publicly, knowing them to be frowned upon almost universally. They concentrate their efforts, rather, upon limiting the pre-medical course to two years, a length of time utterly insufficient for the acquisition of more than a smattering of any sort of education whatever.

The method pursued by the majority of prominent medical colleges is to require two years of pre-medical, mainly scientific, study, and to make a three or four years preparation to this optional. This system leads to great dissatisfaction, especially among the few students sufficiently enlightened to have completed a college degree before entering the actual study of medicine. These are faced by two disturbing facts. In the first place, the average youth will not for a moment consider lingering in the academic grove for four years when he can plunge into what he considers the real preparation for his life's work after two

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short years of preliminary study. Hence, the more adequately trained man finds himself in the demoralizing position of associating with persons who are obviously his inferiors in training, but who suffer no ostensible disadvantage in their actual medical studies. What is worse, he finds himself in the rear of persons who have confined themselves to the minimum requirement of the pre-medical two years in some one-building university or minor denominational college, and who, as third-year men in medicine, consider themselves to be infinitely his superiors.

Another condition, still more disintegrating to the morale, faces the student who comes to the study of medicine after four years of good scientific preparation. This youth, following the advice of those supposed to know, has been convinced that the foundations of the intelligent study of medicine lie in mathematics, physics, and chemistry. He enters the first medical courses with confidence, aware of his superiority over the majority of his fellows. It is easy, then, to imagine his dismay when he discovers that he knows far more of physics and chemistry than

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any of his medical instructors, so that if he were to ask one of them to explain a biological phenomenon in terms, let us say, of physical chemistry, his question could only result in the humiliating confession of the professor's ignorance. Being, let us hope, a young man of tact and discretion, he refrains from so disgracing his mentors. Instead, he shuts up, and regards with an evil eye the glib-memoried, poorly prepared young ignoramuses that surround him, who shine in the estimation of their instructors by reason of their parrot-like ability to reel off the enormous numbers of unrelated facts which they diligently cram out of text-books. The better-prepared individual, whom a training in mathematics, physics, and chemistry has taught to question and to think, rather than to remember voluminously, idiotically, and indiscriminately, finds himself almost invariably in the rear ranks. He turns with bitterness upon those advisers who had the effrontery to pretend that the basis of medicine is really scientific.

Now, it is clear that opinion favoring the intensive pre-medical study of physics and chem-

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istry, while not universal, is at least becoming more and more general. It would be logical, then, to believe that these sciences are not merely contributory to medicine, or separate from it. On the other hand, the only reason for their intensive pursuit would seem to lie in the idea that they really are basic to all medical study. This will be evident from a consideration of the views of modern physiologists of the type of Jacques Loeb, who regard all living things as physico-chemical mechanisms. From this point of view, all physiology must concern itself with the study of the phenomena of life in terms of chemistry and physics. And pathology should devote itself to the consideration of the derangements suffered by the physico-chemical mechanisms that constitute the animal body.

If the studies of the first years of medicine were looked at in this way, it is easy to see that they might be closely unified. Under such a régime the enormous importance now attached to the description of the structures of the body could be greatly minimized. And it follows that the present top-heaviness of the so-called "labora-

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One might look for a different attitude and method in the teaching of the other first-year branches, such as bacteriology or physiology. But here again one finds excessive stress laid upon morphologic considerations in bacteriology, and upon ancient mechanical ones in physiology. So much attention is given to a study of the appearance of, let us say, the diphtheria bacillus that there is small time for a consideration of its infamous activities in producing derangements in the physicochemical equilibrium of our internal economies. When some enterprising instructor begins to ask students to explain what they see in terms of physical chemistry, he is generally looked upon as an unpractical theoretical high-brow, having little knowledge of the needs of a practising "doc," wishing only to befuddle his pupils with "catch questions."

The study of disease, that is to say, pathology, is seldom brought into close relationship to the study of the abominable activities of the microbes which produce the majority of our malaises. Nor is it considered in unison with physiology, which attempts to elucidate the admirable and

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delicate physicochemical arrangements that preside over the normal functioning of our bodies. On the other hand, the professor of physiology looks askance at the pathologists for assigning lessons of such length that the students find it necessary to slight physiology. The pathologist, in turn, attempts cleverly to preempt some of the time he feels to be unfairly devoted to biochemistry. The demarcations between each of these closely interdependent branches are kept in sharp definition, and the instructors in each one tend to deprecate the excessive amount of time given to studies other than their own.

Meanwhile, the student plunges blindly but manfully forward, spending whole mornings in class-rooms, entire afternoons in the laboratory, and, after a hastily snatched dinner, consumes untold kilowatts of electrical power in a diligent but befuddled effort to memorize a sufficient modicum of each of his subjects to make a presentable showing in the class-room next day. He rarely has a moment for the thoughtful consideration of disease as a whole, or of the organism as a whole. And at present, after such a

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bawl hell out of us when we had time to work up only ten?"

But the old doc in question changes from the grinning fiend of those days to a sort of melancholy figure, to be cursed gently in sentimental retrospect. The neophytes of the bedside wonder how he can pass his days in his stupid "lab," when glittering fame and mountains of shekels would be his for the asking, were he to transfer his activity from a mere peering through the microscope and a prodding of students to the lucrative fields of the consultant or to the dramatic wizardry of the operating-room.

The gap that the students consciously realize to exist between the laboratory and the hospital work of the medical course is also apparent in the underground, and sometimes open, hostility existing between the laboratory and clinical professors. The former are properly indignant at seeing their efforts flouted by the fledglings who have just taken up hospital work. They resent having to spend hours in preparing materials, in demonstrations, in long laboratory periods, in the routine of hammering facts into the heads of a

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heterogeneous assortment of numskulls, only to see these same dunces favor them with nose-thumbings, with grimaces, and with leering smiles of condescension, after arriving at the dubious dignity of hospital study. The professors of the sciences undoubtedly think that part of this *mépris* is subtly inculcated by the clinical teachers. These last, recipients of princely incomes, owners of motor-cars, necromancers of bedside lore, are held in vastly greater respect by the majority of students.

The clinical professors, on the other hand, generally regard the biochemists, physiologists, pathologists, and anatomists of the laboratories as well-meaning, learned, but extremely impractical fellows, whom nature has endowed with the patience to spend endless hours over the microscope, before the colorimeter, or among stinking cadavers, but who have not that mysterious utilitarian penchant, nor the magnetic personality that would qualify them for clinical teaching or for lucrative practices.

This opposition between laboratory and hospital, almost invariably existing as an undercurrent, at times flares up into open strife, divid-

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ing the clinicians and the scientists into armed camps, which engage in jousts for ascendancy in the college. Such battles are of a quality of short-sightedness and nonsensical emptiness that would cause them to be regarded as the caperings of buffoons were they not so deleterious to the progress of medical education. They result in a reduction to absurdity of an attempt at the liaison that should exist between the laboratory and the hospital.

These conflicts are due largely to a confusion of ideals which has been dwelt upon at length in the chapter on "A Misunderstanding of the Rôle of the Physician." For until medical educators resolutely face the fact there is no such thing as a science of medicine, and that the study of disease is a matter distinctly apart from the art of healing, the existing confusion will only be multiplied. At the present time, the first two years of medical instruction assume that all of the students are to become investigators of the problems of disease. Each individual is held to the same criteria of excellence, or, to be more accurate, of mediocrity. Excepting in institutions

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of the type of the Johns Hopkins and Harvard University medical schools, specialization in the laboratory branches in the earlier years is discouraged. The teaching is directed at the divine average, lauded by that prophet of democracy, Walt Whitman. Needless to say, the men of inquiring mind and extraordinary ability must of necessity be held in check to wait upon the rank and file of mediocre persons and the rear-guard of unmitigated dunderheads. What is more, if a student shows extraordinary talent, he is in effect asked to apply it alike to subjects that interest him and to studies which he considers fatuous and boring. In a word, he is required to strive for a uniform excellence in all of his work. This tends to inhibit his impulse of inquiry in the field for which he feels himself to have a flair. It may be objected that such a student is immature and does not know what study he is really fitted to engage in during his subsequent career. This objection applies to high school graduates of eighteen and to college sophomores. But such striplings have in reality no place in the serious business of medicine. The demand of those who

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favor the college degree as a prerequisite to medical education is undoubtedly justified.

After the mob of individuals with heterogeneous talents and aptitudes has been treated for two years as if each one were an embryo scientist, it is subsequently propelled into the field of practical endeavor in the hospital. This kind of work is entirely antithetical to the spirit of science. Persons who, fired by a spirit of inquiry, might wish to stop and investigate the nature of an interesting case of exophthalmic goiter are hurried by the recitation bell to attend a séance of obstetrics, which they may consider to be empty and inane. The final year of the medical course is devoted to a bewildering profusion of subjects, comprised mainly of various lucrative specialties. These subjects are taught by so-called clinical "professors" of dermatology, of otolaryngology, of ophthalmology, who increase the prestige necessary to their commercial success by the wearing of academic robes. Thus the callow undergraduate of the fourth year, who should occupy all of his time with the arts of clinical and laboratory diagnosis and with the

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craft of surgery, controlled by the discipline of the necropsy, is enticed into premature ambitions to specialization.

Now, to add to the mêlée, come those who demand that this wonderful mélange of opathies and ologies be welded into a *science* of medicine! This brings about a confusion twice confounded. The clinical professors are right in their resistance to the attempt to turn the hospital of the medical school from a place for the teaching of diagnosis and surgery into a glorified rabbit-hutch where the patients are looked upon as experimental animals.

This critique may be objected to as destructive, and as leading to no solution of the problems that are at present so vexing to medical educators. This is, however, by no means the case. For the moment it is understood that medicine cannot be turned into a science, and that it would on the other hand be a lamentable nullification of its progress to make it entirely practical, the way is open to sweeping changes which would greatly clarify the present murk of cross-purpose and misunderstanding. What is necessary is a

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pital, the importance of intimate contact with the teacher would be insisted upon. In short, there would be a return to the preceptor system in vogue in America in the early part of the nineteenth century. This system recognized that the lore of medical practice and the craft of surgery are to be learned best by the method of apprenticeship practiced of old by doctors, and still common in the honorable gilds of plumbers, brewers, and glass-blowers. This would be greatly superior to the present alleged bedside teaching, where groups of from six to twenty students simultaneously endeavor to absorb the wisdom of a single instructor.

The rudimentary nature of the laboratory instruction given to the majority of students whose intentions were avowedly practical would leave time for the intensive and elaborate scientific instruction of the few individuals whose bent really lies in the direction of the study of disease. Such men now and always will constitute an insignificant proportion of any medical class. Consequently, they would be enabled to work in intimate contact with members of the scientific staff,

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who under such a régime would have leisure for uninterrupted investigation, and would not, as at present, have to perform their experiments at lunch-time, between recitation periods, or in the dead of night, a time that should be devoted to rest. The greater part of the time of these instructors is now given to the hopeless attempt to inculcate the facts and esprit of science into an indiscriminate assortment of youth, all but two or three of whom do not, and never will, know what it is all about.

Under the prevailing dispensation, one of two methods is open to the teacher of the laboratory studies. First, he may aim at the diligent hammering of his theories and facts into the rank and file of the class, who have little understanding and less respect for them. In so doing, he necessarily holds back the students who have a natural aptitude for the subject. This is the democratic method, and is in favor, it is sad to relate, in the great majority of medical schools. Secondly, he may direct his efforts toward the bright and understanding ones, and allow the majority to remain frankly in the state of mystifica-

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tion in which it is natural and inevitable that they should exist. This is the aristocratic method and is generally frowned upon and discouraged. The procedure was greatly admired by the writer in the days, happily long past, when it was his duty to play the task-master to hordes of embryo medicos. He conducted his course at a speed which the apt and interested students could maintain. He left the remainder to struggle along as best they might. He encouraged a few interested and intelligent individuals to engage in fledgling attempts to swim in the sea of the unknown. He observed the way in which they reacted to the buffets of its storms. These efforts were looked upon with great disfavor by his colleagues, who accused him of engaging in "grand-stand" research, and of luring the youngsters who had become his satellites away from a proper standard of excellence in their other studies.

As things go at present, encouragement of extraordinary ability is not praised. On the other hand, a hot-house rearing of inferiors and num-skulls is considered the acme of pedagogic skill. In brief, it is equalitarianism in education that

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is applauded. Now, any one privy to the nature of science knows that it must be understood and advanced by the few. This is completely anti-pathetic to the spirit of democracy, which absurdly considers "John Smith to be the equal of his superiors."

The plan of early sharp division of those wishing to be practitioners of medicine from the ones aiming at the scientific study of disease would certainly make it possible for the latter to test their metal in research. What is more, it would release the practical-minded youths of the majority from mystified gropings in a fog of fact and doctrine that must remain for always incomprehensible to them.

These ideas are in practice to some extent at medical schools of the type of the Johns Hopkins and Harvard. These institutions are, however, severely criticized by the majority of medical educators. They are alleged to create a high-brow spirit and to fail to turn out an adequate supply of the "practical doc." The critics pride themselves on being professors in colleges which produce "all-round" physicians. They perhaps

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do not realize that they aid in throttling at birth a number of individuals whose scientific work might have been of great value in the study of disease. Now, it will be clear that under the plan suggested above, all medical schools might produce men capable of becoming good practising physicians or competent surgeons, and at the same time afford facilities for the production of a constant small number of high-brows without whom advance in medicine would be impossible.

The present strictures made by some medical educators against the high-browism of certain of the great Eastern schools are undoubtedly justified to some extent. And the teachers in the latter are right in accusing the rank and file of medical colleges of suppressing science and, by their Philistinism, reducing their institutions to the level of mere technical schools.

The plan of returning to the preceptor system for practical students in the hospitals will be criticized on the ground that the number of youths is too large to make such an idea feasible. As things exist now, only a few endowed institutions are able to limit the number of their en-

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trants. The State universities have been founded with the idea of educating all persons whose parents have the funds and the social aspiration to send them thither. Any idea of limiting arbitrarily the number of students in the medical school of such a university is scoffed at as impracticable and intolerable to the citizens of our democratic commonwealths. Under present conditions, such a medical department is required to accept, as first-year students, a constantly increasing number of applicants. All that is asked is that these pass satisfactorily the two years' hodgepodge of pre-medical requirement. This may be accomplished with a moderate amount of application by any one not in the category of the imbecile. There is not the semblance of an attempt at the selection of prospective medicos on the basis of a predilection for the art of healing, or of a penchant for the study of disease.

The constantly increasing munificence of the various medical specialties is attracting to the study of medicine an always greater number of undesirables of a greedy acquisitiveness, with no notion at all of the essentially religious nature

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of the art of healing, and with no reverence for the high calling of the science of the study of disease. They scoff at disinterestedness. They talk constantly of specialties which will afford them the best incomes. Medical schools are at present thronged with such pests who, having no spirit of disinterestedness to begin with, naturally become more materialistic as they near the goal of their ambitions. It is this species of gouger who drives out the last struggling representatives of the splendid old type of general practitioner, and who makes a commercial obscenity of the pretentious new institution of group medicine.

The present dissertation is not for a moment to be considered as a polemic against equalitarianism, which is doubtless with us to stay. It would be as futile to attempt to put it down by argument as to talk the pyramids of Rameses out of existence. But even the loudest whooper of its excellences cannot presume to praise a system which permits the entrance of such an indiscriminate rabble into the important function of medical practice or of the study of disease.

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It is really entirely possible to limit the number of medical aspirants, even in a State university, without offending too grievously our zealous guardians of equality. This could be effected, not by setting up an arbitrary numerical limit, nor by constantly increasing the numbers of years of required pre-medical preparation. The latter scheme has been tried and does little to reduce the number of incompetents and undesirables. But it might be brought about by a rigid system of entrance tests. These examinations could be of two types, the one suitable to college graduates whose aim it is to be practitioners or surgeons, the other adapted to the training of the graduate in science who enters medicine with the purpose of the study of disease. Such tests, if based upon thinking ability and not devoted to the discovery of the irrelevant encyclopedic knowledge of candidates, would reduce the number of entrants with appalling rapidity. Of course, it is granted that such suggestions are impossible of realization so long as the faculties of medical schools point with pride to classes of one hundred and fifty students. So long as the

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aim of education is the standardized production of intellectual Fords, it is a palpable fatuity to recommend methods which might result in the completion of an occasional Locomobile.

With a medical education rearranged according to these suggestions, it might be possible to mitigate the intellectual flabbiness that is rampant in the medical profession. This vagueness and lack of mental rigor is notorious in physicians. A recent army intelligence test showed doctors from civil life to be 60 per cent. below engineers, distinctly inferior to teamsters and quartermasters, and but little superior to veterinarians or dentists. There may be some reason to criticize the accuracy of such tests and to assign a large experimental error to them. On the other hand, their results only confirm the opinion long held by close observers of the two professions.

The cause of the high average competence of engineers and of the intellectual muzziness of most doctors is to be sought in the very nature of their respective callings. The engineer works in constant fear of a catastrophic revelation of any

blunders he may make. If he bungles his calculations in the construction of a bridge, the structure may collapse under the weight of a train-load of Rotarians, or other prominent and important people. The burden of such an appalling disaster will then in all probability fall on his shoulders, after having been traced to his error. He is for this reason held up to a high level of intellectual rigor. He must be exact. His bluffs and uncertainties and cheatings will return upon him with the accuracy of well-aimed boomerangs.

Now, it is evident to every one that this is not the case with physicians. A high discipline was practised upon surgeons and other medicos by the ancient Babylonians, who legally punished certain mistakes by cutting off the hands of the bungler, and who rewarded more serious ones by a summary removal of his head. This plan was plainly of merit, and the number of bluffers and shysters among the doctors of Babylon must have been noticeably less than that which is plaguing us at present. Under the existing régime, the bungling doctor is protected by his fellows under

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the conspiracy of silence euphemistically entitled *medical ethics*. He may insure himself against malpractice, and large funds are at his disposal to hire clever lawyers who may be able to free him, no matter how glaring his culpability. It is admitted in the gild that many patients are killed through ignorance or downright blundering. It is, however, perfectly easy for physicians to palm off such mistakes on the irony of fate, the cruelties of a just God, or the inexorable and insurmountable whims of nature. It is difficult to deny him when he maintains that the patient has passed away *despite* his skilful efforts. On the other hand, it is almost invariably the custom for him to claim a cure as his own when nature may in reality have effected it. The patient and family are, for reasons elaborately explained in preceding chapters, prone to accept the intervention of physicians as decisive. It is easy to see how these conditions bring about a general esprit of buck-passing on one hand, and a pretension to unreal power on the other.

Much might be done to saturate the medical neophyte with a different spirit during his medi-

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cal course. This might be accomplished, first, by a constant war against the covering up of ignorance by clever guessing or bluffing. It might be stimulated in the second place by an incessant and relentless checking of diagnoses at the necropsy table. This important branch of pathology should, indeed, be made the pivot around which involves all of the teaching of the aspirant to practical medicine or surgery. A rigid adherence to this plan, and a move to institute it throughout the practice of medicine as well, would blow a cold blast of honesty through halls that now stink with bluff and pretense.

It is true that this plan would necessitate a campaign of education, aiming at the removal of the present superstitions of the masses in regard to the carving of their dead. This might, however, be accomplished by the tactful reminder that the necropsy is of importance, both in advancing medical knowledge and in checking up competence of physicians.

CHAPTER IX

THE SCIENCE OF THE STUDY OF DISEASE

ONE of the most praiseworthy of modern American traits is that aptitude for co-operation which has resulted in an organizing genius surpassed only by Germans. This spirit has to a large extent conquered the individualistic and rapacious tendencies in American industry. Our scene becomes less and less a thing of boisterously struggling piratical small commercial fry, and more and more one of serene impregnable corporations of the type of United States Steel or the Standard Oil. It is well known that these organizations are immensely powerful, and are at times even superior to governmental authority. It is recognized that the centralization which has resulted in them has brought about a great increase of efficiency. They constitute an enormous improvement in method

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of production over the clamorously competitive and undisciplined little manufacturers of former days. They turn out unparalleled quantities of such necessities as gasoline and steel rails. They improve constantly in their consideration of employees. The smoothness of their organizations and their paternal regard for their faithful house-carls gives the lie to the dark predictions of Marx. Radical thought clamors no longer for their destruction by an outraged proletariat, but quietly asks instead for their democratization. Their methods were greatly appreciated and widely used by European countries during the hostilities just now brought to a partial cessation. This appreciation from abroad has greatly enhanced their already formidable prestige.

In fact, the beauties of organization have so impressed the leaders of all of our activities that attempts are now being made to extend this method to the creations of philosophers, astronomers, artists, musicians, and scientists. The products of all of these workers have up to the present been considered to be the result of ex-

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treme individualism. The idea of coöperation has been seized upon in the formation of the National Research Council, which counts as its members leaders of all of the various branches of science. This body intends to introduce efficiency, which has become a necessity to industry, into science, which has until now been a field for intellectual romantics, whose instincts are those of the free-lance and the explorer. The Research Council intends that there shall no longer be any bewildered fumbling and groping in the dark. It plans, instead, to block out precisely the receding territories of the unknown, and to parcel out definite problems to constantly increasing battalions of well-disciplined investigators.

Each one of these soldiers in the scientific host is to have his little problem to work out. The question he is to ask of nature is to be precise, limited, and as nearly as possible amenable to a definite answer. In a word, he is to invade the unknown in a definite direction and to keep always in touch with his base of supplies. He is to keep in communication with the overlords of

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his science. He is not to poach upon the territories carefully marked out for his fellows.

He is denied the privilege of wandering forth, equipped only with the rifle of his intelligence, and thus to remain for long periods of lawless and impudent penetration of the forests and jungles of ignorance. Should his supply of grub begin to fail, or his ammunition to run low, he is not to improvise ways and means of subsistence which will insure further penetration. Rather it is his duty to return to his base of supplies for a replenishment of the recognized provender. Should he be baffled by uncharted marshes or unscalable heights, it is not for him to conquer these by his unaided wit. Instead, he is to return to his director of exploration, who, as the fount of knowledge, will devise a way out of his difficulty.

The Germans had already to a large extent perfected this organization of research before the war. At the beginning of the war, it was sneered at and condemned by Germanophobe scientists in America. But at the termination of the strife,

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the Teutonic origin of coöperative research had been forgotten, and the evil effects of organized science were no longer condemned with the patriotic fervor of former years. On the other hand, the beneficent results of its activities were acclaimed on all sides. Accordingly in Cincinnati, in 1919, the president of the Federated Societies of Experimental Biology eloquently praised the merits of this type of science in the recent conflict. It was difficult to discover, despite careful attention, the exact nature of the fundamental discoveries that resulted from it. This, however, is an unimportant detail. It is enough that this stirring speech gave the impression that the benefits of coöperative science were beyond description.

In the instance of German science, the advantage of quantity production of researches is manifest to every one. The annual output of investigations of all kinds is enormous, and fills countless volumes of *Zeitschriften*, *Zentralblätter*, and *Wochenschriften*. These admirably printed periodicals, filled with formidable masses of work in all conceivable branches of knowledge,

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are in some respects to be regarded with astonishment and awe. It makes the rapidly growing body of scientific knowledge readily accessible. Ignorance of the more recent advances in any science is inexcusable. A discovery may now be common property on the morrow of the day it is made. It has recently been suggested that the German publicity methods, now enthusiastically copied in America, be extended still further. If this takes effect, scientific advances may be heralded by efficient distributing agencies of the type of the Associated Press, which may cause newspapers to publish special editions of the nature of our present indispensable sporting extras.

But this type of scientific organization in Germany, despite its manifest excellences, has brought about some evil tendencies which must fill the sympathetic observer with dismay and even with disgust. The worst of these is the tone of deference to established reputation and respect for authority that is evident among the younger scientists. The trend is toward the clerical spirit. A scientist makes a discovery of

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some importance, enunciates a ponderous theory on its basis, becomes a *Geheimrat*, and attracts a horde of followers, German, Hungarian, English, Japanese, American. These disciples come eagerly to the shrine, and sweat earnestly over an *arbeit* emanating from the central great intellect of the *Herr Direktor*. The research involves almost invariably discoveries supporting the central theory. It would be considered a downright impudence for a student even accidentally to discover a fact which might be embarrassing to the dogma laid down by the presiding priest. Thus, in such organizations, one observes the splendid and inspiring spectacle, celebrated by poets, of "a hundred minds with but a single thought, a hundred hearts that beat as one."

This growth of the barrack spirit is spreading with rapidity in American science, especially with that concerned with the study of disease. It is antithetical to the spirit of all creative endeavor. For, while *esprit de corps* is laudable in an armed citizenry or in the production of bath-tubs, motor-tractors, and three-inch guns, it is damnable in adherence to scientific dogma, or in support of a

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school of music, literature, or painting. Galileo founded modern experimental physics. He was considered a heretic and an Antichrist by the reactionary clergy of his day. But he privately thumbed his nose at his inquisitors, who then formed the only body of intellectual authority. What is more, he did not attempt to erect his laws of motion into a dogma against the church, or to attract a horde of worshipfully slavish adherents to his views. The same is true of Lavoisier and Faraday and Pasteur. These men were free-lances and innovators, smashers of the contemporary idols of ignorance and superstition. It would have been absurd to ask them to bow to the reigning savants of their day. Their explorations were free and untrammeled. They would have laughed at the idea of a research council to lay out their problems, or of a director before whom to do obeisance.

To tell the truth, a genuine piece of scientific investigation is always a highly individualized affair. And real investigators, though they may seek advice and welcome discussion of their problems, will always resent interference from above,

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or attempts of other minds to change the direction of their penetration of the unknown. Original ideas on how to bolt a cylinder on a Ford motor might throw out of gear the whole laudable and astounding organization for the production of that national necessity. Such an innovator would be peremptorily and justifiably "fired." On the other hand, it is just as ludicrous to imagine the director of a laboratory for the scientific study of disease attempting to standardize the thoughts and methods of his scientific henchmen. For it is their very waywardness of thought and the heresy of their methods that frequently result in important discoveries.

In America it becomes the fashion to ape the Germans. Directors begin to employ disciplined scientists with special penchants, to synthesize researches. This is just as absurd as to imagine a painter having an admirable conception of a beautiful landscape, who would proceed to its creation by employing a corps of specialists, one to paint the trees, another to do the hills, a third to daub in the cows, and a fourth to fashion the

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pretty dairymaid who milks them. A great painter has an arrogant belief that he alone is capable of executing each of these details in the proper manner. A great scientist is equally mistrustful of the experiments and results of his underlings. Despite this, the *dernier cri* in the American study of disease seems to be that of a great brain, having many splendid ideas, sitting in an attitude of profound abstraction in a secluded cabinet, and parcelling out the products of his cerebration to awe-struck underlings, who then hurry to their laboratories to prove the validity of the concepts of the master intelligence.

The number of men engaged in the study of disease increases constantly. It may be objected by those who favor the idea of scientific directors that there are many men in the ranks of this rapidly growing army who have not the originality necessary for the elaboration of intelligent concepts. The question arises as to the disposition of such individuals, who have faithful and clever hands but wooden heads. The answer is plain. Such persons should not presume to the rôle of investigators. What, then, is to become

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of the great brain, with its volcanic eruptions of ideas? The answer is clear. Its possessor should work out and test his own concepts. It is true that such a procedure would greatly decrease the productivity of the active intelligence. On the other hand, he would have the priceless opportunity to see and to do his own experiments, and not merely to examine their results with satisfaction or disgust, as the case might be. Most surprising and unexpected turns of events occur in the course of an experiment. These accidental and unforeseen results are frequently ignored by the henchman who has manual cleverness, but not an alert or questioning mind. The French physiologist, Claude Bernard, insisted that his most important discoveries arose from accidental observations made in experiments, the objectives of which were in an entirely different direction. The same remark has been made by the Belgian immunologist, Bordet. This investigator does all of his experiments himself. He doubtless has a thousand ideas which he has not the time to put to test. But despite this, he

THE SCIENCE OF THE STUDY OF DISEASE has found time to advance the science of immunology more than any other living man.

It follows that the only kind of permissible assistance in the science of the study of disease is the kind that functions under the very eyes of the directing intelligence. This can be procured by the employment of personally trained technicians, or of youngsters just making their bow in the field of research. Such help is far less expensive than that of the unimaginative *super-dieners* calling themselves scientists, who now so largely infest the laboratories for the study of disease. The abolishment of the idea of a scientific directorate would greatly reduce the number of scientific workers. This might be lamented, but only by those who seek to mitigate the evil of unemployment. For it is certain that fundamental advances in the science of the study of disease are not increasing in proportion to the augmenting numbers of investigators.

There is really not the slightest hope of such a healthy purgation of the ranks of the students of disease. The institution of the scientific di-

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rectorate becomes more popular and more firmly established. All that can be hoped for is the occasional accession to power of broad-minded, tolerant overlords, who do not tyrannically exploit the power that is given to them. These lines are not penned as counter-propaganda, which would be fruitless. They are written as a sort of Jeremiad over a system which tends to make the investigators of disease an aggregation of paid house-cretes, subservient to dubious generalissimos, rather than to association of independent and wide-ranging knights, who prefer to explore alone the dangerous lands and to slay unaided the horrible dragons that plague us.

The inroads on our valuable forests and the increase in the number of pulp-mills in America arising from the plethora of scientific periodicals on medical subjects are largely due to the great number of persons unjustifiably usurping the function of investigator. These realize that the regular appearance of their names in periodicals will increase their prestige and afford them opportunity for better places with greater emolument. This results in a flooding of such periodi-

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cals with inane repetitions of previous work and empty investigations of inferior quality. Such a mass of material makes it a difficult task to keep abreast of real scientific advance. It is not arduous in the sense that all of this piffle demands perusal, but rather because the multiplication of periodicals has resulted in libraries of labyrinthine complexity.

Such an avalanche of publications makes it difficult to discriminate between good work and bad. Let a man write in a sufficiently persistent and voluminous manner and he is almost sure to gain a hearing and to be respected. Thus it may happen that the name of a person whose scientific product is inferior or even erroneous will be on the lips of every one. Such is the case of a notorious German biochemist. This investigator owes much of his fame to his introduction of a test for pregnancy. It is amusing to relate that by this test men, as well as women, are frequently found to be with child. Such a phenomenon is, of course, outside all human experience. The test must be valueless to all who do not believe that the order of nature has been

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upset. Yet the originator of the method is held in great esteem in America as well as in Germany. On the other hand, names like that of the American bacteriologist, Elser, are obscure and little known. This savant has published a single *magnum opus*, which belongs to the classics of his science. Yet it is safe to estimate that the majority of American students of disease are hardly aware of his existence.

The mania for rapid and profuse publication is not ascribable only to the large number of mediocre individuals who presume to study disease. It is, in addition, the result of the modern love of self-advertisement, in which our countrymen are particularly proficient. Like professionals of the advertising art, our more prolix investigators know that it is not necessary that their goods have especial merit. It is needful only, by a constant and variegated repetition, to keep their wares in the public eye. Accordingly a successful year in certain laboratories is often estimated by the number of papers published. A case in point is that of a good clinical professor of great merit and distinction. This person

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came one bright morning, his chest protruding with pride, to the laboratory of the writer. After perfunctory and courteous questions in regard to the progress of the investigations there conducted, the visitor, no longer able to contain himself, burst out with the information that *his* laboratory had had a splendid year, since nine scientific papers had gone out from it in the short space of nine months!

Another cause of this promiscuity of publication is the wild desire for priority. The majority of workers are in a constant state of fear that some colleague will rush into print just ahead of them. This phobia results in an unnatural strained effort and in a fatuous spirit of competition. Work is done under a pressure which usually results in researches that are incomplete, hurried, and botched. Unhappily, the isolation and parochialism that enabled Leonardo da Vinci to spend more than twelve years on the famous "Cenacolo" are no longer with us. The student of disease works with one eye on his experiment, the other searching anxiously for the publications of those he knows to be laboring in the same

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field. It is rare for any one in medical research to spend years in silence, patiently unraveling the tangled strands of a knotty problem. Indeed, it is customary to shy at questions that cannot be answered in a few months. And it is the rule to consider that an investigator has lapsed into innocuous desuetude when he has failed to publish a paper for a space of two or three years. George Moore asserts that the invention of rapid means of communication has resulted in the death of art. His position is probably extreme. But it is certain that the science of the study of disease suffers greatly from the lack of isolation and leisure necessary to strictly original effort and to exquisitely finished work.

Finally, the abundance of scientific reading matter leads to another serious danger. Many investigators do not go to nature for their problems. They seek them, rather, in the library. Thus, one of America's leading pathologists remarked in passing that he had read something "while in the library, searching for a problem to work on." This person is generally held in

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high esteem. His name is ranked among the ten most prominent investigators in his branch. Yet the remark just quoted must be regarded as an admission of empty-headedness, not to say imbecility. For it is almost certain that research starting from a perusal of the work of others holds the danger of preconceived ideas, which are entirely out of place in science. It is impossible to imagine Harvey searching the mystical books of Galen for the inspiration to his work on the circulation of the blood. Or of Pasteur initiating his fundamental researches by a consultation of the inane medical speculation of his time. Or of Bordet turning the strong beam of his lucid intelligence on the dark questions of immunity, by perusing previous literature on the subject. On the other hand, these investigators, and other great ones like them, began their researches by the observation of natural phenomena that impressed them as important. They formulated hypotheses on the basis of these observations. They then put these hypotheses to test by careful experiment.

It has been remarked in a previous chapter

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that the fruitful study of disease really began with the investigations of Pasteur. Before this time, isolated careful observations and a few brilliant experiments had been made by lonely investigators of the type of Harvey, Leeuwenhoek, Spallanzani, and Magendie. But the seeds of these experiments fell upon unproductive ground. These men were far in advance of their times. They worked in a *milieu* of superstition, ignorance, and bigotry even more appalling than the one existing at the present time. Pasteur was a chemist and carried the careful methods of that science into the study of the mysteries of disease. He was laughed at and bitterly opposed by the majority of medical investigators. A few enlightened ones finally realized the importance of his discoveries, and at last a multitude of scientists began to flock to his support and to elaborate his researches. But it is curious to relate that very few of them consistently used his objective methods, or shared his conviction of the physicochemical nature of the mechanism of all living processes. Instead, the majority em-

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ployed the morphological methods of the German pathologist, Virchow. This savant had insisted upon the importance of microscopic observation and description of changes occurring in the cells of diseased organisms. He cared little for the elucidation of the mechanism that gave rise to these changes. Such study as that of Virchow is immeasurably simpler than the experimental method of attack, especially when the latter is based upon the methods of physics and chemistry. So it was natural that descriptive science should appeal to medical men wishing to shine in the field of investigation, but who were innocent of the precision methods necessary to the chemist or physicist. It consequently became the mode to describe the appearance of things rather than to investigate their mechanism. This spirit spread rapidly from Europe to America, and by the early nineties of the last century, Americans were vying with Europeans in the discovery of new bacilli, and in admirable and lengthy description of the appearance of diseased tissues. Scant attention seemed to be

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given to the fact that men like Pasteur cared little for descriptive science but probed always into the mechanism of phenomena.

The plethora of merely descriptive investigation resulted in the heaping up of an immense literature, comprising scattered and more or less connected fact. In pathology, these data are of value to clinicians in the checking of diagnosis, but have been of little importance in the elucidation of the phenomena of life and disease. Such a body of knowledge is to be compared to the careful observations of an explorer who penetrates an unknown land. The microscopic study of diseased tissues almost invariably necessitates the killing of that portion which it is desired to investigate. During this process, changes in structure may take place which might totally alter the appearance of tissues as they existed in the living state. Therefore, it is usually fatuous to draw sweeping conclusions from the examination of such devitalized tissues. An example of the sterility of this type of effort is to be found in the study of cancer. An enormous amount of microscopic investigation has been

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devoted to the appearance of cancerous tissues. Clever methods of coloration have been evolved, making the detection of such noxious growths an easy matter to experienced persons. Pretentious laboratories, erected at great cost, are devoted to work of this kind. But it is safe to assert that the time and money so expended have done virtually nothing to advance our knowledge of the nature and etiology of cancer. The directors of such laboratories now probably realize the sterility of such effort. But it is disgusting to observe that they do not mend their ways. On the contrary, when investigations like those of Murphy begin to throw new light on the problem, these high priests of morphology use the energies of their minions in the attempt to prove that he is wrong.

It was a relatively easy thing to make startling and dramatic discoveries in the days following the investigations of Pasteur. New phenomena were exposed with the greatest ease, in much the same manner as prospectors might uncover rich veins of ore in a new and unexplored territory. Thus it happened that men of no more than

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mediocre ability became notorious by the attachment of their names to a bacillus causing a disease or to some new phenomenon requiring rather simple means for its demonstration. This type of research was largely qualitative in nature. It did not demand the meticulous care necessary to accurate physical and chemical experiments. It was consequently easy of accomplishment by persons with the rough training and vague methods of thought current in the medical world. It flourished gorgeously in America, for our nation is notoriously the land of the slap-dash, sloppy type of activity. As a result, the majority of medical research for the first thirty years after the ground-breaking work of the French and Germans is of a nature causing conscientious investigators to blush.

On the other hand, it is true that a few American experimenters deserve to rank with the European Nestors in the study of disease. The most prominent of these are F. G. Novy and Theobald Smith. Both of these men refused to be pushed into that insane fury of competitive effort and indiscriminate production which is

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laudable in the manufacture of brass cuspidors but entirely out of place in science. The investigations of Smith in Texas fever and tuberculosis, and of Novy on relapsing fever and the trypanosomes, belong to the real classics of bacteriology. These men employ the exactness of technique and the painstaking accuracy necessary in chemistry. Neither of them wasted his time in propounding idiotic theories or in whooping in support of doctrines enunciated by others. Rather, they concerned themselves with the revelations of important and solid facts. Their experiments have a precision and finish that insure their easy verification. Their work stands out in strong contrast to a great mass of incomplete and hasty investigation, usually imitation or elaboration of European achievement. Experiments of the latter kind are frequently notable chiefly for the total absence of controls, and read much like the directions for the preparation of a chowder in the admirable volume of culinary instruction compiled by the noted Mrs. Rorer.

The multiplication of descriptive research and

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surface explanation led to confusion and finally to stagnation. The rapid uncovering of surface phenomena began to slacken. It seemed that the students of disease had advanced to the foot of an unscalable cliff. The cause of this sterility after brilliant beginnings is not far to seek. It was due, without doubt, to the failure to recognize thoroughly the necessity of the quantitative methods of physics and chemistry, which involve a patience and relentless rigor foreign to the majority of the students of disease.

Preposterous theories took the place of penetrating investigations. These were metaphysical in nature, and are to be called facile visualizations or speculations, rather than theories. For a theory, to be valuable, explains all of the facts that appear in the domain that it presumes to elucidate. Also it should be possible to make verifiable predictions on its basis. It should be presentable, if possible, in the form of a mathematical expression. Such theories are of the utmost value in science and serve not only to correlate seemingly disparate facts, but make possible the *a priori* prediction of new ones.

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This is not the nature of the so-called theories common to the study of disease. Examples of these are the side-chain theory of Ehrlich and the protein split-product theory of Vaughan. These had no sooner been enunciated than numerous facts were discovered which were inexplicable in their light. The promulgators of these doctrines were then required to evolve elaborate and fantastic subhypotheses in their defense. The battles raging round them ceased to be the conflicts of experimenters and took on the appearance of the vaporings of schoolmen. It was necessary to assume the presence of substances for the existence of which there was not the slightest experimental evidence. What is more, rather than aiding the progress of knowledge of disease, they were of evil influence because their facile diagrammatic nature was easy of comprehension by simple intellects and so tended to produce the impression that the problems of immunity and anaphylaxis were explained and settled. In America Ehrlich's theory of immunity was religiously taught and its terminology slavishly employed long after it

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had been reduced to absurdity by the researches of Bordet and of Arrhenius and Madsen. It is now less popular, but its decadence results, it is sad to relate, rather from patriotic considerations than from intellectual conviction. This has led Bordet to remark sardonically that Marshal Foch is to be thanked for the victory of his ideas.

It is gratifying to relate that the possibility of an entirely new attitude in the study of disease is beginning to appear in America as well as in Europe. Physical chemists are at last beginning to invade the jungle of contradictory facts in which medical investigators wallow. In Europe, the movement began with the quantitative investigations of Arrhenius and Madsen in immunity. The Dane Sörensen and the German Michaelis have made great strides in the field of biochemistry, and begin to lift that body of knowledge from its cook-book status.

The American protagonist in the spirit of quantitative physicochemical investigation of life phenomena is Jacques Loeb. Although his work is in the field of general physiology, which seems far removed from that of the problem of disease,

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in reality this remoteness is an illusory one. His illuminating researches on the chemistry of proteins should be capable of early application to the study of disease. His efforts begin to attract followers from the ranks of physical chemists. In the field of biochemistry the names of Van Slyke, Folin, Falk, and others are connected with quantitative researches with definite application to the problems of disease.

It is not advisable to clamor impatiently that this new spirit will rapidly solve the obscure problems of disease. For these last are of a baffling complexity and may have to be attacked for a time by the nibbling tactics of Joffre rather than by the penetrating or encircling ones of Foch or Ludendorff. It will be difficult to convince the majority of medical investigators that it is futile to continue their researches without fundamental knowledge of the exact sciences. At present there are too many of these persons who learn by rote the delicate methods evolved by chemists, use them with confidence and abandon, and draw idiotic and unjustifiable conclusions from their employment.

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It is necessary to attract physicists and chemists to the study of biology and the problems of disease. This will be difficult, since such men are rapidly befogged by the bewildering mass of fact and the still formidable vestigia of medieval medical jargon that it is necessary for them to master. Again, they recognize the great complexity of vital phenomena, and do not feel comfortable in the presence of the numerous difficultly controllable variables that are inherent in the mechanism of living organisms. Accustomed to be accurate to the third and fourth decimal place, they naturally shy at experimental errors of 5 per cent. Finally, they doubtless resent the attitude of the majority of eminent medical investigators who regard them as mere handmaidens and presume to map out problems that can only be solved by their knowledge and technique. This is, once more, a manifestation of the evil of the medical director of research, who sits in his remote office evolving problems, calling in turn upon physicists, bacteriologists, and chemists for their solution.

It follows that any rapprochement between

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genuine scientists, such as physical chemists, and embryo investigators of the type of the majority of students of disease, must be in the nature of a free collaboration. The chemist must have a real interest in biological problems. These are actually rather simple in statement, when the fog of superfluous data and idiotic speculation is removed. Until medical educators realize that the prospective students of disease must have a really thorough training in chemistry and physics, and until they are able to teach their subjects from this point of view, it will be futile for medical graduates to attempt unaided investigations of this type. Inadequately trained, they tend to apply the sloppy methods of biological and medical research to the exact science of chemistry, rather than to introduce chemical methods into biology. All that is possible at present would seem to be the collaboration alluded to above.

CHAPTER X

THE MASTER PHYSICIAN AND THE ANTI-PHYSICIAN

DESTRUCTIVE criticism is condemned by all public-spirited citizens of our nation. They contend that it is not right to tear down institutions and customs unless the critic has something better to substitute for the things he has just demolished. It is doubtful whether the alternative plans proposed by people of synthetic bent are ever of a merit superior to the institutions they replace. This, however, seems to be of minor importance. What is needed is the alternative suggestion.

Those who have patiently followed the writer's trend of thought through the preceding dissertations may consider him to be charged with the spirit of Dionysus, rather than with the sane, constructive esprit of Apollo. It is true

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that less thoughtful readers might consider him to be a person of indignation, given to berserker rages, delighting in scenes of demolition and the contemplation of the resulting chaos. He hastens to assure his readers that this is not true. His admiration is all for the synthetic rather than for the analytic aspects of life. He has been led to his criticisms only by the conviction that it is futile to go about the erection of an imposing edifice by superposing it on ramshackle buildings of worm-eaten wood. It seemed necessary first to rid the world of these rickety structures and to dig deep foundations as a preliminary to creative activity.

But civilization is a vast compromise. Nothing is done thoroughly, cleanly, and in the grand manner. And so the complete overthrow of the modern practice of medicine would be as impracticable and impossible as a complete destruction of the whole fabric of society. It is the fashion to erect halls of granite on substructures of flimsy pine. It is customary, when one has criticized, to end on the constructive note. Out of deference to the mode, despite the note of

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urbane and restrained criticism that has prevailed throughout these dissertations, it would seem wise to terminate the argument with a synthesis. One cannot believe with *Candide* and his modern successor, *Pollyanna*, that this is the best of all possible worlds. On the other hand, good citizenship demands that one should contribute one's mite toward making it so.

The following plan for the future organization of the practice of medicine is the result of an anonymous collaboration.

An acquaintance, who is not a physician, but a man of affairs, of clear vision and of breadth of view, is responsible for the plan about to be suggested. His outline, delivered in clear and concise sentences, showed a complete absence of that formalism, conservatism, and hesitation in the face of difficulties to be observed in members of the medical profession itself.

The modern advance in knowledge of disease has created a body of learning and technology too vast to be mastered by those persons of average intelligence from whose ranks the general practitioners are drawn. What is more, the

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strains and complexities of urban civilization are resulting in obscure diseases which the family doctor is incompetent to diagnose or to treat.

Specialization in medicine is consequently a necessity. Uncontrolled specialization has led to the excesses and imbecilities dwelt upon in foregoing chapters. The present attempts at "group medicine" are groping efforts to coördinate the present high differentiation of function in medical practice. But the emphasis in the group is too much on mere technical skill and on economic considerations. The patient represents an object for so-called scientific study and a source of income. More stress should be laid on the fact that he is first of all a human being.

The elaboration and extension of the group is inevitable and desirable. But its activities should in every case be coöordinated by a central directing intelligence, or master physician. This last will be a person of maturity, an able diagnostician, thoroughly acquainted with surgery, privy to the importance, in diagnosis and treatment, of the science of pathology, bacteriology, and blood chemistry. His primary function

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would be that of a governor, able to curb the excesses of enthusiasm that each specialist must inevitably feel for his branch. Left to themselves, specialist surgeons, neurologists, endocrinologists, blood chemists, one and all tend to "run wild." Controlled by a real master intelligence, their coördinated efforts might become very valuable. Needless to say, the authority of the chief should be autocratic.

In addition, the master physician would supply the personal touch which is now frequently lacking in the activities of the group. He would realize the immense importance of the patient's morale. He would make as intelligent as possible a use of the still completely empirical knowledge of the power of mind over body. This power, while completely mysterious, undoubtedly exists, and is made use of by faith-healers, psychoanalysts, and Christian Scientists. These individuals, despite the inanity of their theories and bodies of doctrine, occasionally work marvelous cures. The master physician would not pooh-pooh at these cults because of the general emptiness of their ideas. Instead, he would

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make a discriminating use of the methods of all of them. In his hands the present mysterious nature of these phenomena might begin to become clear. He would coördinate the present high development of surgical technique and laboratory diagnosis with his own ability as a general diagnostician and his understanding of the obscure influence of the mind over bodily malaises.

It would seem, at first glance, that such organization of medical practice on a large scale would demand its nationalization. This, however, would really be infeasible, in the light of the inherent inefficiency of democratic forms of government. It would seem advisable to preserve the present organization of medicine along the lines of private endeavor. Some elaboration and modification of the idea originated at the Mayo Clinic would certainly be practicable. That is to say, patients would be charged for the services rendered them strictly on a basis of their incomes. This would be greatly superior to the plan recently proposed and put in operation by the Johns Hopkins authorities, who have de-

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cided to limit the fees for operations to a sum not exceeding one thousand dollars. Since the equipment and organization of groups on a large scale is very costly, it would seem unwise to follow the Johns Hopkins plan. For if our modern plutocrats were not occasionally made to disgorge huge sums for operations, the less fortunate middle class would find the burden of medical care still heavier than it is at present.

The writer greatly admires the splendid picture of the possibly glorious renaissance of medicine painted by his constructively-minded acquaintance. He would indorse this plan, fight for it, preach it from the housetops, die for it, if he believed that it could be put into operation with the personnel of the medical profession as it exists at present. The lack of intellectual vigor and honesty in the medical profession has been alluded to again and again in preceding chapters. The causes of this lamentable condition have been pointed out.

It is possible that master physicians of the type just visualized might be able to infuse into their groups a new esprit of honesty, a disdain

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for the contemptible stand-from-under attitude now so common in medicine. Accordingly, with all possible respect for the plan of medical organization just outlined, the writer wishes to add another qualification to those which the master physician must possess. In a preceding chapter the intellectual discipline noticeable in the engineering profession has been compared to that of the medical cult, to the great disparagement of the latter. But it is demanded that the chief of the group be endowed with the spirit of another type of citizen, whose *métier* demands on accuracy of knowledge and rigor of conduct and mental discipline superior to that of any other body of men. This man is the ship-captain. Any one acquainted with the sea knows of the high discipline reigning on shipboard. The skipper knows, even more than the engineer, that his mistakes will be visited on his own head. Consequently, when his ship comes to grief, he prefers to go down with it, rather than meet the disgrace attending demotion and the entry of his name in the black-book. He is a skipper because he loves the sea and his ship. His disregard of

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great financial reward is notorious. One seldom hears him whine piteously over the small amount of his income as compared to the long years spent in preparation for his calling. He would disdain the frantic wail that went up from medicos, great and small, when the Johns Hopkins plan for the limitation of emolument was announced.

As has been mentioned before, the Babylonians rewarded the blunders of their doctors by the removal of hands, or heads, according to the severity of the mistake. This plan was full of wisdom and is an evidence of the sagacity of the leaders of that civilization. It is, however, unsuitable to the refined sentiments of our era, which frowns upon all mutilations except those performed en masse in the process of the world's democratization.

The morale existing among the physicians of the future will have to be akin to that of the shipmaster. It will be the fear of disgrace rather than the fear of capital punishment that will have to animate the master physician. He will

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have to prefer to die rather than kill his patient unnecessarily. And realizing his responsibility, he will be able to hold his subordinate specialists of the group to similarly high level of discipline.

It would seem that this spirit could only be brought about by a relentless checking of the doings of physicians. This could only be accomplished by necropsy of all persons dying, and comparison of the necropsy findings with the final diagnosis of the master physician. Nobody complains about the high spirit of discipline and efficiency existing among the masters, officers, and crews of ships. It is on this that the great safety of travel depends. If the population realized that its medical care could be made incomparably more efficient by compulsory necropsy of all the dead, performed by impartial, intelligent, and accredited pathologists, the present superstitious objection to such procedure would soon disappear. The master physician of the future, in addition to the quality of humanity, acumen in psychology, broad training in the technology of medicine and its con-

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tributory sciences, must possess the high feeling of responsibility that is the outstanding characteristic of the shipmaster.

It remains to supplement this constructive suggestion with another, hardly less valuable. Again, it is necessary to admit that the idea does not really belong to the writer. He has it from a friend whose views are still broader, if less optimistic, than those of the first collaborator. This friend has suffered much at the hands of doctors. He has the misfortune to be a chronic invalid, and has passed a large part of his life as a subject of experiment and financial exploitation by physicians, great and small.

Despite his trials, his attitude toward life is serene and unruffled. He does not curse God; he refrains from excoriating the devil; he hesitates to denounce the medicine men who have had such a large share in the multiplication of his troubles. Instead, he regards the medicine men with an eye full of compassion and understanding. From his remote window on Riverside Drive, he gazes on stylish doctors rolling past in expensive limousines, and smiles the

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patient smile of a god who has made a mess of a world, and who regretfully realizes that there is nothing to be done about it.

His constructive suggestion is full of sense, and is born of an experience with doctors that only chronic invalids enjoy. It will appeal to these, and to intelligent people who are well but who realize that sickness may some day be their lot. It will be particularly attractive to efficiency experts, who stand aghast at the tremendous wastage that is everywhere apparent in our civilization.

Chronic invalids, says this friend, are at present a great burden to society. They devour produce; they take up the time of servants who might otherwise be profitably employed as prohibition agents; they engage the attention of nurses who might otherwise function efficiently as manicurists. In return they give nothing to society, save maybe an unending dirge of complaint against their bitter lot. They are a nuisance; they are expensive; they are in the way; they are inefficient. What to do with them?

The constructively-minded friend suggests

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that invalids would furnish excellent material for a new type of official, operating not with, but *against* the medical profession. This functionary would be called the ANTI-PHYSICIAN. He would be in the employ of the state or the municipality, and it would be his duty to advise, free of charge, all persons who feel themselves to be on the verge of sickness or chronic invalidism. Advise them in regard to what? In regard, of course, to the doctors that it would be wise for the prospective patient to avoid!

The chronic invalid has had experience with many doctors. He has gone, almost invariably, from one spurious savior to another. He has clutched at this straw and that. At last he has come to regard with a cold analytical eye all those who pretend to be able to heal him. He knows their foibles, their vanities, their shams, their pretenses.

Who, then, could be more valuable in the warning of prospective sick ones against the more charlatanish and incompetent of our medicine men? It would seem that the institution of the anti-physician would preserve many people

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from terrible experience with poor doctors—in short, with fakers, commercialists, rogues, and bluffers. Such doctors, deprived of their clientele by this warning off of their prospective patients, would rapidly disappear from the field of the treatment of disease.

It is for others to work out the details of this admirable suggestion. Objectors will arise at once to assert that this institution would be very amenable to graft. Doctors would pay the anti-physician to refrain from denouncing them. But it would be possible to prevent this by paying these new functionaries princely salaries, and by giving them life appointments, amid surroundings of ease and luxury. What is more, every chronic invalid would not be eligible for this rôle. The requirement for the office would not be based on any college degrees the candidate has received, nor upon any academic honor or mark of distinction. For it is notoriously true, if rather paradoxical, that the higher education in America increases credulity and dims the judgment, rather than the reverse.

The anti-physician would be chosen from the

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ranks of the incredulous, the cynical, the *désenchanté*, the Descartian doubters. His métier might have been that of the peasant, the joiner, the stone-mason, the saloonkeeper. He would almost never be chosen from the ranks of ministers of the gospel, or lawyers, or doctors, and only rarely from among scientists. For these professional people, strangely enough, are most frequently lacking in the ability to analyze, to pierce shams, to see clearly through pretense.

Efficiency experts will realize that this plan would give useful employment to thousands of people who are now nothing but burdens on society. It would abolish untold suffering through inept, unskilful, and dishonest medical attention; it would remove thousands of inept, unskilful, and dishonest doctors from the practice of their honorable calling. The master physician with his spirit of the shipmaster, contending with the anti-physician with his hatred of fraud, would be a potent force in the renaissance of the medical art, if my two constructively-minded friends are to be believed.

It is customary, when one has criticized, to end

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on the constructive note. Out of deference to the mode, the argument has been terminated with a synthesis. It is the deepest regret of the writer that these suggestions were not his own. He had, perforce, to borrow them from his friends. He was forced to do this because he himself does not believe it possible to construct halls of granite on substructures of flimsy pine.

